

Attorney's Docket No. 102121.00014	Express Mail Label No. N/A	Mailing Date January 16, 2007	For PTO Use Only Do Not Mark in This Area
Application No. 10/644,552	Filing Date August 19, 2003	Attorney/Secretary Init TMJ/lb	
Title of the Invention ADJUSTABLE CONCEALED BODY ARMOR			
Applicant Sandra Leigh Hatfield et al.			
Enclosures Reply in Response to Office Action dated August 15, 2006 Marked-up Specification Clean Copy of Specification Marked-up Drawings Formal Drawings Check in the amount of \$450.00 Return Receipt Postcard			

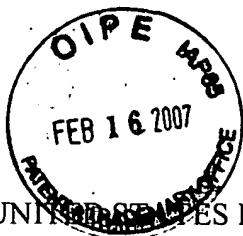
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PATENT & TRADEMARK OFFICE

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Docket No. 1014	Express Mail Label No. N/A	Mailing Date January 16, 2007	For PTO Use Only Do Not Mark in This Area
No. 2	Filing Date August 19, 2003	Attorney/Secretary Init TMJ/lb	
Invention ADJUSTABLE CONCEALED BODY ARMOR			
Applicant Sandra Leigh Hatfield et al.			
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Attorney Docket No.: 102121.00014

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Sandra Leigh Hatfield et al.
Serial No. : 10/644,552
Filed : August 19, 2003
Title : ADJUSTABLE CONCEALED BODY ARMOR

Art Unit : 3765
Examiner : Patel, Tajash D.

MAIL STOP AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY IN RESPONSE TO OFFICE ACTION DATED AUGUST 15, 2006

Please amend the above-identified application as follows:

CERTIFICATE OF MAILING BY FIRST CLASS MAIL
I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

1/16/2007

Date of Deposit

Signature

Linda Bowden

Typed or Printed Name of Person Signing Certificate

Amendments to the Specification:

Please replace the paragraphs beginning on page 1, line 20 with the following new paragraphs:

- -FIGS. 1A and 1B are is a pattern drawings for an embodiments of the ~~the outside~~ front outershell of the body armor of the present invention;

FIGS. 2A and 2B are is a pattern drawings for an embodiments of the ~~the outside~~ back outershell of the body armor of the present invention;

FIGS. 3A and 3B are pattern drawings for embodiments of the inside front ballistic panel and back ballistic panel of the body armor of the present invention;--

Please insert the following paragraph on page 1 after the paragraph beginning "FIG. 5 is an illustration. . .":

- -FIG. 5A is a perspective view of the embodiment of FIG. 5 on a user, with the front outershell removed; - -

Please replace the paragraphs beginning on page 2, line 4 with the following new paragraphs:

- -FIG. 8 is a photograph an illustration of the front view of one embodiment of the present invention;

FIG. 8A is a photograph an illustration of a fragmentary view of FIG. 8 showing the hidden zipper and the opening for stabilizer tab pull through;

FIG. 9 is a photograph an illustration of the back view of one embodiment of the present invention;

FIG. 9A is a photograph an illustration of the fragmentary view of Fig. 9 showing the hidden zipper;

FIG. 10 is a photograph an illustration of the front view of one embodiment of the present invention showing the stabilizer tab when the ~~outer cover~~ outershell is closed and the tab is threaded through;

~~FIG. 10a is a photograph of the fragmentary view of Fig. 10 showing a cut away view of the bottom of the panel with the loop that goes around button of the trouser to hold panel in place;~~

Please replace the paragraph beginning on page 2, line 16 with the following new paragraph:

--FIGS. 12A and 12B are ~~photographs~~ illustrations showing the front and back respectively of one embodiment of the present invention.

Please insert the following paragraphs on page 2, after the paragraph beginning "The present invention is described in relation to its use as a body armor having a front protective section. . .":

--Referring to FIGS. 1A to 4B, various embodiments of outershells and ballistic panels are shown. Specifically, FIG. 1A depicts an embodiment of a front outershell 2. The front outershell includes a right front outershell shoulder area 3, which is on the right shoulder of a user when worn, and a left front outershell shoulder area 4. Figure 2A depicts an embodiment of a rear outershell 5. The rear outershell 5 includes a right rear outershell shoulder area 6 and a left rear outershell shoulder area 7. Each of these outershells 2, 5 is configured to enable ballistic material or panels to be inserted within the outershells 2, 5. Figure 4A depicts alternative embodiments of a rear outershell 35 that includes right rear outershell shoulder area 36 and a left rear outershell shoulder area 37. Figure 4B depicts a further embodiment of a rear outershell 45 that includes right rear outershell shoulder area 46 and a left rear outershell shoulder area 47.

Referring to FIGS. 3A and 3B, an embodiment of a front ballistic panel 15 includes a right shoulder region 23 and a left shoulder region 24. Likewise, an embodiment of a rear ballistic panel 25 includes a right shoulder region 26 and a left shoulder region 27.--

Please replace the paragraph beginning on page 2, line 26 with the following new paragraph:

-- In one embodiment of the present invention, the shoulder straps 10 are concealed and include complete adjustability within the outer shell shoulder. ~~In another embodiment, the~~

~~adjustability of shoulder straps 10 are hidden within the outer shell shoulder.~~ FIGS. 5, 5A and 6 are illustrations of this embodiment. FIG. 6 shows that the shoulder strap 10 is indirectly attached to ballistic panel 15 by stitching 12 through ballistic panel 15 and shoulder strap 10. suspension tabs 14A and 14B. The suspension tabs 14A and 14B are stitched to the ballistic panel 15 at a shoulder region of the ballistic panel (e.g., right shoulder region 23 and left shoulder region 24). The suspension tabs 14A and 14B may be one portion of a hook and loop fastener (i.e., the hook portion). The shoulder strap 10 may include the mating portion of the suspension tabs (i.e., the loop portion). The shoulder strap 10 is sandwiched between the suspension tabs 14A and 14B, providing the indirect attachment to the ballistic panel 15 and the adjustability. To adjust the shoulder strap 10 to a particular user, the user may cut the shoulder strap 10 to length, and then sandwich the proper length shoulder strap between the suspension tabs 14A and 14B. As such, the ballistic panel 15 is substantially prevented from shifting during wear and extreme conditions, while substantially eliminating the common problem of rolling and sagging, which is typically found in soft, flexible vests. FIG. 5 and 6 also illustrates that the suspension tabs 14A and 14B and the shoulder strap 10 is under outershell fabric 20. The shoulder strap 10 and outershell fabric 20 may lie in different positions, as shown by the dotted lines of FIG. 6. The shoulder strap 10 may be a neoprene top loop system or elastic removable straps. FIG. 5A shows an embodiment of the present invention on a user 100, with the front outershell 2 removed for clarity. FIG. 7 is an alternative embodiments where shoulder strap 10 is concealed by sandwiching the shoulder strap 10 between top layer 20 and middle layer of the outer shell 22. - -

Please replace the paragraph beginning on page 3, line 10 with the following new paragraph:

- - Referring to FIGS. 8-11C, in ~~In~~ a further embodiment of the present invention, a stabilizer tab 30 is directly sewn to the ballistic panel so as to stabilize the ballistic panel against the body. FIGS. 8 and 8A show an embodiment for the opening 60 in front outershell 62 for stabilizer tab 30 to pull through. FIG. 10 shows another view where stabilizer tab 30, ~~when outer cover is closed and tab 30 is threaded through~~ the front outer shell 62. In a further embodiment, FIGS. 11A-C show direct attachment of stabilizer tab 30 to the ballistics.

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A body armor system for protecting a user from penetration, comprising:
 - a front protective section for overlying the chest region of the user;
 - a rear protective section for overlying the back of the user;
 - ~~a pair of a flexible right shoulder strap and a flexible left shoulder straps fastened to right and left shoulder regions, respectively, of the rear section, wherein the straps extend over the right and left shoulders of the user for attachment to corresponding right and left portions of the front section;~~
 - an outer shell, which outer shell includes a shoulder area;
 - wherein the shoulder straps are at least partially hidden within the outer shell shoulder area, wherein the shoulder straps include adjustability within the outer shell shoulder area, and wherein each of the shoulder straps is indirectly attached to a front ballistic panel by stitching through the front ballistic panel and at least one suspension tab at the right shoulder region of the front ballistic panel and at least one suspension tab at the left shoulder region of the front ballistic panel the shoulder strap, the right shoulder straps being removably attached to the at least one suspension tab at the right shoulder region of the front ballistic panel and the left shoulder straps being removably attached to the at least one suspension tab at the left shoulder region of the front ballistic panel; and
 - wherein a stabilizer tab is directly sewn to the ballistic panel ~~so as~~ to stabilize the ballistic panel against the user's body.

2. (Previously Amended) The body armor system of claim 1, further comprising:

a hidden zipper in the front protective section where the ballistic panel is inserted.

3. (Previously Amended) The body armor system of claim 1, further comprising:

a slit in a bottom of the front protective section where the ballistic panel is inserted.

4. (Previously Amended) The body armor system of claim 1, further comprising:

a cumber band attached to an inside of the outershell to provide additional security to the rear section.

5. (Previously Amended) The body armor system of claim 1, further comprising:

the front protective section having substantially no seams or attachment points.

6. (New) The body armor system of claim 1 wherein the suspension tabs are one-half of a hook and loop fastener and the shoulder straps further comprise a second-half of the hook and loop fastener.

7. (New) The body armor system of claim 1 wherein the pair of flexible right and left shoulder straps are indirectly attached to a rear ballistic panel in the rear protective section by stitching through the rear ballistic panel and at least one suspension tab at the right shoulder region of the rear ballistic panel and at least one suspension tab at the left shoulder region of the rear ballistic panel, the right shoulder straps being removably attached to the at least one

suspension tab at the right shoulder region of the rear ballistic panel and the left shoulder straps being removably attached to the at least one suspension tab at the left shoulder region of the rear ballistic panel.

8. (New) A body armor system comprising:

a front ballistic panel disposed in a front outershell, the front ballistic panel having a front left shoulder area and a front right shoulder area;

a rear ballistic panel disposed in a rear outershell, the rear ballistic panel having a rear left shoulder area and a rear right shoulder area;

at least one suspension tab directly attached to each of the front left shoulder area and front right shoulder area of the front ballistic panel;

a left shoulder strap attached to the rear left shoulder area of the rear ballistic panel and to the at least one suspension tab at the left front shoulder area of the front ballistic panel; and

a right shoulder strap attached to the rear right shoulder area of the rear ballistic panel and to the at least one suspension tab at the right front shoulder area of the front ballistics panel;

wherein the left shoulder strap attaches to the at least one suspension tab at the left front shoulder area of the front ballistic panel and the right shoulder strap attaches to the at least one suspension tab at the right front shoulder area of the front ballistic panel within the front outershell.

9. (New) The body armor system of claim 8 further comprising:

at least one suspension tab directly attached to each of the rear left shoulder area and rear right shoulder area of the rear ballistic panel;

wherein the left shoulder strap is attached to the rear left shoulder area of the rear ballistic panel by the suspension tab at the rear left shoulder area; and
the right shoulder strap is attached to the rear right shoulder area of the rear ballistic panel by the suspension tab at the rear right shoulder area, wherein the left shoulder strap attaches to the at least one suspension tab at the left rear shoulder area of the rear ballistic panel and the right shoulder strap attaches to the at least one suspension tab at the right rear shoulder area of the rear ballistic panel within the rear outershell.

10. (New) The body armor system of claim 8 further comprising a stabilizer tab directly sewn to the front ballistic panel to maintain the front ballistic panel against a user's body.

11. (New) The body armor system of claim 8 wherein the at least one suspension tab is one-half of a hook and loop fastener and the shoulder straps further comprise a second-half of the hook and loop fastener.

12. (New) The body armor of claim 8 wherein the at least one suspension tab includes one-half of a removable fastener and the shoulder straps further comprise a second-half of the removable fastener.

13. (New) The body armor of claim 12 wherein the removable fastener is selected from the group consisting of a button, a snap, and a hook-and-loop fastener.

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Amendments to the Drawings:

“Replacement Sheets” are attached which includes a clean version of amended Figures 1A, 2A, 3A, 3B, 4A, 4B, 5, 5A, 6, 7, 8, 8A, 10, 12A and 12B. The attached sheets replace the original sheets including amended Figures 1A, 2A, 3A, 3B, 4A, 4B, 5, 5A, 6, 7, 8, 8A, 10, 12A and 12B.

“Annotated Sheets Showing Changes” are also attached with includes a marked-up version of amended Figures 1A, 2A, 3A, 3B, 4A, 4B, 5, 5A, 6, 7, 8, 8A, 10, 12A and 12B, with changes indicated in red.

Applicant proposes amending Figures 1A, 2A, 3A, 3B, 4A, 4B, 5, 5A, 6, 7, 8, 8A, 10, 12A and 12B as indicated in red on the attached Annotated Sheet Showing Changes to add annotations, correct errors between the original drawings and the corrected drawings originally submitted, and more clearly point out the invention. Applicant respectfully submits that no new matter is added as a result of these changes to the drawings.

Applicant also proposes deleting Figures 1B, 2B and 10A.

REMARKS

Claims 1-5 are pending in the application. Claim 1 is independent. Applicant has amended the specification, drawings and claims. Applicant has added new claims 6-13, new claim 8 being independent. Applicant submits that no new matter is added by any of these amendments. Each amendment is supported by the specification as originally filed, drawings as originally filed and claims as originally filed. Applicant has included a redline version of the entire specification to assist the Examiner, as well as a clean copy of the amended specification. Applicant also respectfully requests that the Examiner approve the proposed amendments to amended Figures 1A, 2A, 3A, 3B, 4A, 4B, 5, 5A, 6, 7, 8, 8A, 10, 12A and 12B.

Claims 1, 3, 4, and 5 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,373,582 to Dragone, et al. (“Dragone”).

Amended claim 1 recites “a flexible right shoulder strap and a flexible left shoulder straps fastened to right and left shoulder regions, respectively, of the rear section, wherein the straps extend over the right and left shoulders of the user for attachment to corresponding right and left portions of the front section. . .wherein the shoulder straps are at least partially hidden within the outer shell shoulder area, wherein the shoulder straps include adjustability within the outer shell shoulder area.” Likewise, new independent claim 8 recites that “the left shoulder strap attaches to the at least one suspension tab at the left front shoulder area of the front ballistic panel and the right shoulder strap attaches to the at least one suspension tab at the right front shoulder area of the front ballistic panel within the front outer shell.” Dragone does not describe or disclose at least the adjustability within the outer shell shoulder area and the single shoulder strap on each of the left and right shoulder.

On the contrary, Dragone discloses straps and fasteners extending from both the front body armor panel and the rear body armor panel (i.e., two straps on each of the left and right shoulder). These straps and fasteners are extended over the user's shoulders in an overlaid fashion. (See Dragone at col. 5, lines 33-42 and Figure 8). The straps from the rear body armor panel then engage the outer layer of a front garment shell (outershell) of the front panel:

Referring to FIG. 5, a front garment shell 34 for retaining body armor panel 1 has an outer layer 35... The outer layer 35 has complimentary fastener means 42, 43, 44, and 45 for accepting mating fasteners which extend from a complementary back body armor panel, as described below.

(See Dragone at col. 5, lines 1-10 and Figure 5; see also col. 5, lines 17-32). It is this attachment mechanism on the outside of the outershell that gives the Dragone system its adjustability. Dragone fails to provide adjustability within the outershell shoulder area.

Further, Dragone does not describe or disclose "a stabilizer tab. . directly sewn to the ballistic panel so as to stabilize the ballistic panel against the user's body" as recited in claim 1, or "a stabilizer tab directly sewn to the front ballistic panel to maintain the front ballistic panel against the user's body" as recited in claim 10. Applicant respectfully disagrees with the Examiner's assertion that Figure 10 discloses such a stabilizer tab. (See Figure 10 and col. 5, line 59 – col. 6, line 7).

In view of the above remarks, Applicant submits that the claims as previously and currently amended are patentable over Dragone, and respectfully requests that this rejection be withdrawn.

Claim 2 has been rejected under 35 U.S.C. § 103(a) as being obvious over Dragone. Applicant respectfully submits that claim 2 is patentable for at least the reasons discussed above with regard to claims 1, 3, 4, and 5, and respectfully requests that this rejection be withdrawn.

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Applicant submits that all the claims are now in condition for allowance, which action is requested.

CONCLUSION

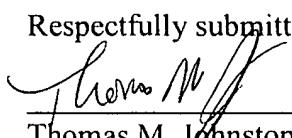
It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claims does not necessarily signify concession of unpatentability of the claim prior to its amendment.

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

Enclosed is a \$450.00 check for the petition for two month extension of time. Please charge any additional fee(s) or credit any overpayments to Deposit Account 50/2324.

Date: 11/16/07

Respectfully submitted,



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CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit under 35 U.S.C. 119(e) of U.S. Provisional Application Serial Number 60/404,435, filed August 19, 2002.

FIELD OF THE INVENTION

Various embodiments of the present invention relate to body armor. More particularly, to a body armor that the shoulder straps are concealed and include complete adjustability within the outer shell shoulder.

BACKGROUND OF THE INVENTION

Body armor have saved the lives of many law enforcement officers and military personnel in recent years. Body armor have been available in recent years as a protective panel having overlying layers of a fabric. The comfort of a body armor is an extremely important consideration because of the heat buildup that occurs from wearing a heavy and inflexible vest for the long hours an officer is on duty. In addition, concealing the body armor is another important consideration. Preventing "riding up" of the armor is yet another important consideration.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be more fully understood and further advantages will become apparent when reference is made to the following detailed description of the invention and the accompanying drawings. However, these figures are merely illustrative and are not meant to limit the embodiments of the invention.

FIGS. 1A is a and 1B are pattern drawings for an embodiments of the outside-front outershell of the body armor of the present invention;

FIGS. 2A and 2B are is a pattern drawings for an embodiments of the outside-back outershell of the body armor of the present invention;

FIGS. 3A and 3B are pattern drawings for embodiments of the inside-front ballistic panel and back ballistic panel respectively of the body armor of the present invention;

FIGS. 4A and 4B are pattern drawings for alternative embodiments of the outside back of the body armor of the present invention;

FIG. 5 is an illustration of the fragmentary sectional view of one embodiment of the concealed shoulder strap of the present invention;

FIG. 5A is a perspective view of the embodiment of FIG. 5 on a user, with the front outershell removed;

FIG. 6 is an illustration of the cross-sectional fragmentary view of the shoulder strap attached to body armor of one embodiment of the concealed shoulder strap of the present invention;

FIG. 7 is an illustration of the cross-sectional fragmentary view of the shoulder strap attached to body armor of another embodiment of the concealed shoulder strap of the present invention;

FIG. 8 is a photograph ~~an illustration~~ of the front view of one embodiment of the present invention;

FIG. 8 A is a photograph ~~an illustration~~ of the fragmentary view of Fig. 8 showing the hidden zipper and the opening for stabilizer tab pull through;

FIG. 9 is a photograph ~~an illustration~~ of the back view of one embodiment of the present invention;

FIG. 9A is a photograph ~~an illustration~~ of the fragmentary view of Fig. 9 showing the hidden zipper;

FIG. 10 is a photograph ~~an illustration~~ of the front view of one embodiment of the present invention showing the stabilizer tab when the ~~outer cover outer shell~~ is closed and the tab is threaded through;

~~FIG. 10A is a photograph of the fragmentary view of Fig. 10 showing a cut away view of the bottom of the panel with the loop that goes around button on the trouser to hold panel in place; and~~

FIGS. 11A, 11B and 11C are illustrations of another embodiment of the present invention where FIG. 11A shows the outside front of the body armor, FIG. 11B shows the inside front of the body armor and FIG. 11C shows the outside back of the body armor.

FIGS. 12A and 12B are photographs ~~illustrations~~ -showing the front and back respectively of one embodiment of the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

The present invention is described in relation to its use as a body armor having a front protective section for overlying the chest region of the user, and a rear protective section for overlying the back of a user. The front section includes a front protective panel. Similarly, the rear section includes a rear protective panel. A pair of flexible right and left straps 10 are fastened to right and left shoulder regions, respectively, of the rear section. The straps extend over the right and left shoulders of the user for attachment to corresponding right and left portions of the front jacket.

Referring to FIGS. 1A to 4B, various embodiments of outer shells and ballistic panels are shown. Specifically, FIG. 1A depicts an embodiment of a front outer shell 2. The front outer shell includes a right front outer shell area 3, which is on the right shoulder of a user when worn, and a left front outer shell shoulder area 4. Figure 2A depicts an embodiment of a rear outer shell 5.

The rear outershell 5 includes a right rear outershell shoulder area 6 and a left rear outershell area 7. Each of these outershells 2, 5 is configured to enable ballistic material or panels to be inserted within the outershells 2,5. Figure 4A depicts alternative embodiments of a rear outershell 35 that includes right rear outershell shoulder area 36 and a left rear outershell shoulder area 37. Figure 4B depicts a further embodiment of a rear outershell 45 that includes right rear outershell shoulder area 46 and a left rear outershell shoulder area 47.

Referring to FIGS. 3A and 3B, an embodiment of a front ballistic panel 15 includes a right shoulder region 23 and a left shoulder region 24. Likewise, an embodiment of a rear ballistic panel 25 includes a right shoulder region 26 and a left shoulder region 27.

In one embodiment of the present invention, the shoulder straps 10 are concealed and include complete adjustability within the outer shell shoulder, in another embodiment, the adjustability of shoulder straps 10 are hidden within the outer shell shoulder. FIGS. 5, 5A and 6 are illustrations of this embodiment. FIG. 6 shows that the shoulder strap 10 is indirectly attached to ballistic panel 15 by stitching 12 through ballistic panel 15 and shoulder strap 10 suspension tabs 14A and 14B. The suspension tabs 14A and 14B are stitched to the ballistic panel 15 at a shoulder region of the ballistic panel (e.g., right shoulder region 23 and left shoulder region 24). The suspension tabs 14A and 14B may be one portion of a hook and loop fastener (i.e., the hook portion). The shoulder strap 10 may include the mating portion of the suspension tabs (i.e. the loop portion). The shoulder strap 10 is sandwiched between the suspension tabs 14A and 14B, providing the indirect attachment to the ballistic panel 15 and the adjustability. To adjust the shoulder strap 10 to a particular user, the user may cut the shoulder strap 10 to the length, and then sandwich the proper length shoulder strap between the suspension tabs 14A and 14B. As such, the ballistic panel 15 is substantially prevented from shifting during wear and extreme conditions, while substantially eliminating the common problem of rolling and sagging, which is typically found in soft, flexible vests. FIG. 5 and 6 also illustrates that the suspension tabs 14A and 14B and the shoulder strap 10 is under outershell fabric 20. The shoulder strap 10 and outershell fabric 20 may lie in different positions, as shown by the dotted lines of FIG. 6. The shoulder strap 10 may be a neoprene top loop system or elastic removable straps. FIG. 5A shows an embodiment of the present invention on a user 100, with the front outershell 2 removed for clarity. FIG. 7 is an alternative embodiment where shoulder strap 10 is concealed by sandwiching the shoulder strap 10 between top outer layer 20 and middle layer of the outer shell 22.

In yet another embodiment, shoulder strap 10 is attached directly to the ballistics through the system disclosed in U.S. Patent No. 4,989,266, wherein the disclosure is incorporated herein. In an alternative embodiment, shoulder strap 10 is attached by a system of a 4 part outer shell

strap attachment system.

In Referring to FIGS. 8-11C, in a further embodiment of the present invention, a stabilizer tab 30 is directly sewn to the ballistic panel so as to stabilize the ballistic panel against the body. FIGS. 8 and 8A show an embodiment for the opening 60 in front outer shell 62 for stabilizer tab 30 to pull through. FIG. 10 shows another view where stabilizer tab 30, ~~when outer cover is closed and tab 30 is threaded through the front outer shell 62~~. In a further embodiment, FIGS. 11 A - C show direct attachment of stabilizer tab 30 to the ballistics.

As can be seen from FIGS. 8 through 11, the present invention provides better concealability.

FIGS. 12A and 12 B illustrate the adjustability of side straps 40 on both the front and back of the outer shell.

In yet another embodiment, the outer shell is provided with a lining that has increased moisture wicking properties. An example of such lining is "Body Sensor" material. The outer shell may be composed of a durable 65/35 poly/cotton material.

In yet a further embodiment, a smooth bi-directional stretch fabric is used on the front center to substantially prevent the uniform shirt from snagging on the fabric and to ensure comfort of the wearer.

In another embodiment, as illustrated in FIGS. 1A, 1B, 2A, 2B, 4A, 4B, 8A, 8B, 9A and 9B, geometric patterns are used to strengthen the seams.

In a further embodiment, topstitching is eliminated to provide a smoother finish and prevent chaffing against the wearer's body.

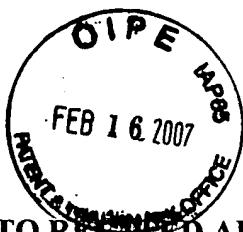
In yet another embodiment, as illustrated in FIGS. 8, 8A and 9A, ballistics are inserted through the front via "hidden" zipper 50. Alternatively, ballistics may be inserted at the bottom to provide a smooth finish and better concealability.

In another embodiment, the positioning of loop fabric and design of straps allows adjustment to be made at an angle in an position.

In a further embodiment, as illustrated in FIG. 9, cummer band 60 can be attached to the inside of the outer shell to provide additional security of the back section of the vest.

FIGS. 3A and 3B illustrate an embodiment having no seams or attachment points and thus, further concealing the body armor.

In yet another embodiment, the pockets on the ballistic panels are sufficiently sized for flexible trauma shields and anti-stab panels. For example, the pockets can be 5 inches by 8 inches and 8 inches by 8 inches.



CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit under 35 U.S.C. 119(e) of U.S. Provisional Application Serial Number 60/404,435, filed August 19, 2002.

FIELD OF THE INVENTION

Various embodiments of the present invention relate to body armor. More particularly, to a body armor that the shoulder straps are concealed and include complete adjustability within the outer shell shoulder.

BACKGROUND OF THE INVENTION

Body armor have saved the lives of many law enforcement officers and military personnel in recent years. Body armor have been available in recent years as a protective panel having overlying layers of a fabric. The comfort of a body armor is an extremely important consideration because of the heat buildup that occurs from wearing a heavy and inflexible vest for the long hours an officer is on duty. In addition, concealing the body armor is another important consideration. Preventing "riding up" of the armor is yet another important consideration.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be more fully understood and further advantages will become apparent when reference is made to the following detailed description of the invention and the accompanying drawings. However, these figures are merely illustrative and are not meant to limit the embodiments of the invention.

FIG. 1A is a pattern drawing for an embodiment of the front outershell of the body armor of the present invention;

FIG. 2A is a pattern drawing for an embodiment of the back outershell of the body armor of the present invention;

FIGS. 3A and 3B are pattern drawings for embodiments of the front ballistic panel and back ballistic panel respectively of the body armor of the present invention;

FIGS. 4A and 4B are pattern drawings for alternative embodiments of the outside back of the body armor of the present invention;

FIG. 5 is an illustration of the fragmentary sectional view of one embodiment of the concealed shoulder strap of the present invention;

FIG. 5A is a perspective view of the embodiment of FIG. 5 on a user, with the front outershell removed;

FIG. 6 is an illustration of the cross-sectional fragmentary view of the shoulder strap attached to body armor of one embodiment of the concealed shoulder strap of the present invention;

FIG. 7 is an illustration of the cross-sectional fragmentary view of the shoulder strap attached to body armor of another embodiment of the concealed shoulder strap of the present invention;

FIG. 8 is an illustration of the front view of one embodiment of the present invention;

FIG. 8 A is an illustration of the fragmentary view of Fig. 8 showing the hidden zipper and the opening for stabilizer tab pull through;

FIG. 9 is an illustration of the back view of one embodiment of the present invention;

FIG. 9A is an illustration of the fragmentary view of Fig. 9 showing the hidden zipper;

FIG. 10 is an illustration of the front view of one embodiment of the present invention showing the stabilizer tab when the outershell is closed and the tab is threaded through; and

FIGS. 11A, 11B and 11C are illustrations of another embodiment of the present invention where FIG. 11A shows the outside front of the body armor, FIG. 11B shows the inside front of the body armor and FIG. 11C shows the outside back of the body armor.

FIGS. 12A and 12B are illustrations showing the front and back respectively of one embodiment of the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

The present invention is described in relation to its use as a body armor having a front protective section for overlying the chest region of the user, and a rear protective section for overlying the back of a user. The front section includes a front protective panel. Similarly, the rear section includes a rear protective panel. A pair of flexible right and left straps 10 are fastened to right and left shoulder regions, respectively, of the rear section. The straps extend over the right and left shoulders of the user for attachment to corresponding right and left portions of the front jacket.

Referring to FIGS. 1A to 4B, various embodiments of outershells and ballistic panels are shown. Specifically, FIG. 1A depicts an embodiment of a front outershell 2. The front outershell includes a right front outershell area 3, which is on the right shoulder of a user when worn, and a left front outershell shoulder area 4. Figure 2A depicts an embodiment of a rear outershell 5. The rear outershell 5 includes a right rear outershell shoulder area 6 and a left rear outershell area 7. Each of these outershells 2, 5 is configured to enable ballistic material or panels to be inserted within the outershells 2, 5. Figure 4A depicts alternative embodiments of a rear outershell 35 that includes right rear outershell shoulder area 36 and a left rear outershell shoulder area 37. Figure 4B depicts a further embodiment of a rear outershell 45 that includes right rear outershell shoulder area 46 and a left rear outershell shoulder area 47.

Referring to FIGS. 3A and 3B, an embodiment of a front ballistic panel 15 includes a right shoulder region 23 and a left shoulder region 24. Likewise, an embodiment of a rear ballistic panel 25 includes a right shoulder region 26 and a left shoulder region 27.

In one embodiment of the present invention, the shoulder straps 10 are concealed and include complete adjustability within the outer shell shoulder. FIGS. 5, 5A and 6 are illustrations of this embodiment. FIG. 6 shows that the shoulder strap 10 is indirectly attached to ballistic panel 15 by stitching 12 through ballistic panel 15 and suspension tabs 14A and 14B. The suspension tabs 14A and 14B are stitched to the ballistic panel 15 at a shoulder region of the ballistic panel (e.g., right shoulder region 23 and left shoulder region 24). The suspension tabs 14A and 14B may be one portion of a hook and loop fastener (i.e., the hook portion). The shoulder strap 10 may include the mating portion of the suspension tabs (i.e. the loop portion). The shoulder strap 10 is sandwiched between the suspension tabs 14A and 14B, providing the indirect attachment to the ballistic panel 15 and the adjustability. To adjust the shoulder strap 10 to a particular user, the user may cut the shoulder strap 10 to the length, and then sandwich the proper length shoulder strap between the suspension tabs 14A and 14B. As such, the ballistic panel 15 is substantially prevented from shifting during wear and extreme conditions, while substantially eliminating the common problem of rolling and sagging, which is typically found in soft, flexible vests. FIG. 5 and 6 also illustrates that the suspension tabs 14A and 14B and the shoulder strap 10 is under outershell fabric 20. The shoulder strap 10 and outershell fabric 20 may lie in different positions, as shown by the dotted lines of FIG. 6. The shoulder strap 10 may be a neoprene loop system or elastic removable straps. FIG. 5A shows an embodiment of the present invention on a user 100, with the front outershell 2 removed for clarity. FIG. 7 is an alternative embodiment where shoulder strap 10 is concealed by sandwiching the shoulder strap 10 between top outer layer 20 and middle layer of the outer shell 22.

In yet another embodiment, shoulder strap 10 is attached directly to the ballistics through the system disclosed in U.S. Patent No. 4,989,266, wherein the disclosure is incorporated herein. In an alternative embodiment, shoulder strap 10 is attached by a system of a 4 part outer shell strap attachment system.

Referring to FIGS. 8-11C, in a further embodiment of the present invention, a stabilizer tab 30 is directly sewn to the ballistic panel so as to stabilize the ballistic panel against the body. FIGS. 8 and 8A show an embodiment for the opening 60 in front outershell 62 for stabilizer tab 30 to pull through. FIG. 10 shows another view where stabilizer tab 30 is threaded through the front outer shell 62. In a further embodiment, FIGS. 11 A - C show direct attachment of stabilizer tab 30 to the ballistics.

As can be seen from FIGS. 8 through 11, the present invention provides better concealability.

FIGS. 12A and 12B illustrate the adjustability of side straps 40 on both the front and back of the outer shell.

In yet another embodiment, the outershell is provided with a lining that has increased moisture wicking properties. An example of such lining is "Body Sensor" material. The outershell may be composed of a durable 65/35 poly/cotton material.

In yet a further embodiment, a smooth bi-directional stretch fabric is used on the front center to substantially prevent the uniform shirt from snagging on the fabric and to ensure comfort of the wearer.

In another embodiment, as illustrated in FIGS. 1A, 1B, 2A, 2B, 4A, 4B, 8A, 8B, 9A and 9B, geometric patterns are used to strengthen the seams.

In a further embodiment, topstitching is eliminated to provide a smoother finish and prevent chaffing against the wearer's body.

In yet another embodiment, as illustrated in FIGS. 8, 8A and 9A, ballistics are inserted through the front via "hidden" zipper 50. Alternatively, ballistics may be inserted at the bottom to provide a smooth finish and better concealability.

In another embodiment, the positioning of loop fabric and design of straps allows adjustment to be made at an angle in an position.

In a further embodiment, as illustrated in FIG. 9, cummer band 60 can be attached to the inside of the outershell to provide additional security of the back section of the vest.

FIGS. 3A and 3B illustrate an embodiment having no seams or attachment points and thus, further concealing the body armor.

In yet another embodiment, the pockets on the ballistic panels are sufficiently sized for flexible trauma shields and anti-stab panels. For example, the pockets can be 5 inches by 8 inches and 8 inches by 8 inches.

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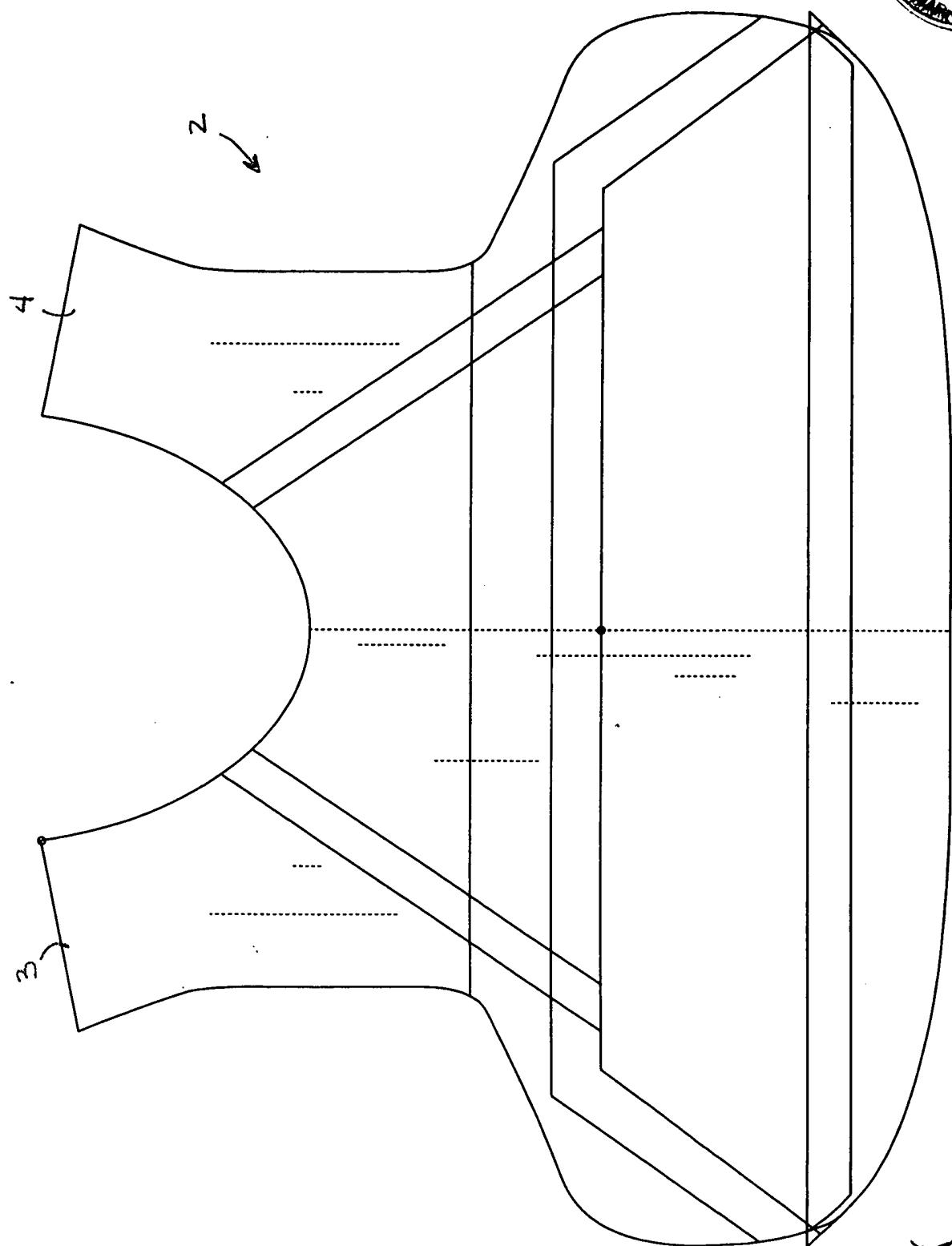


FIG. 1X

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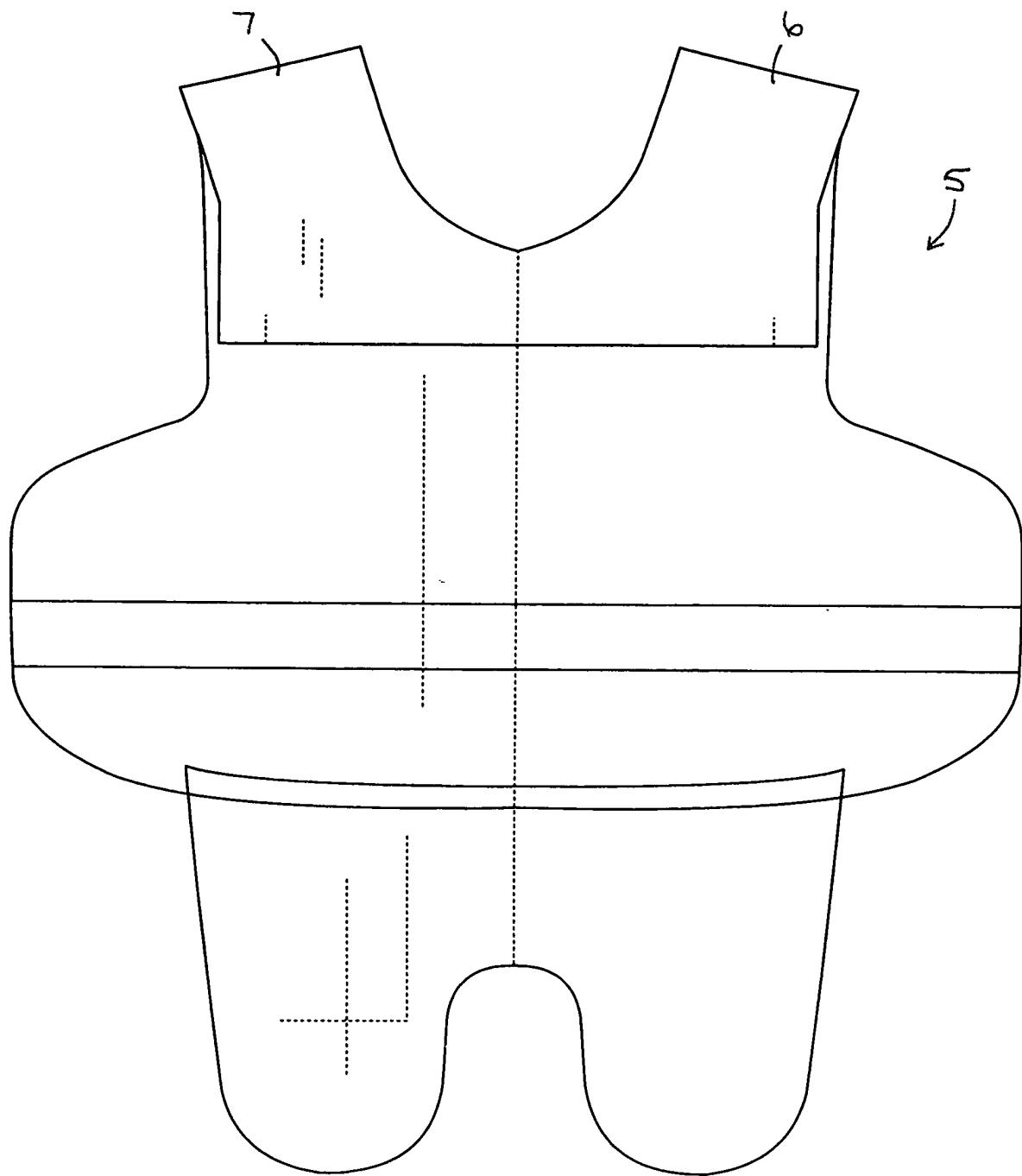


FIG. 2X

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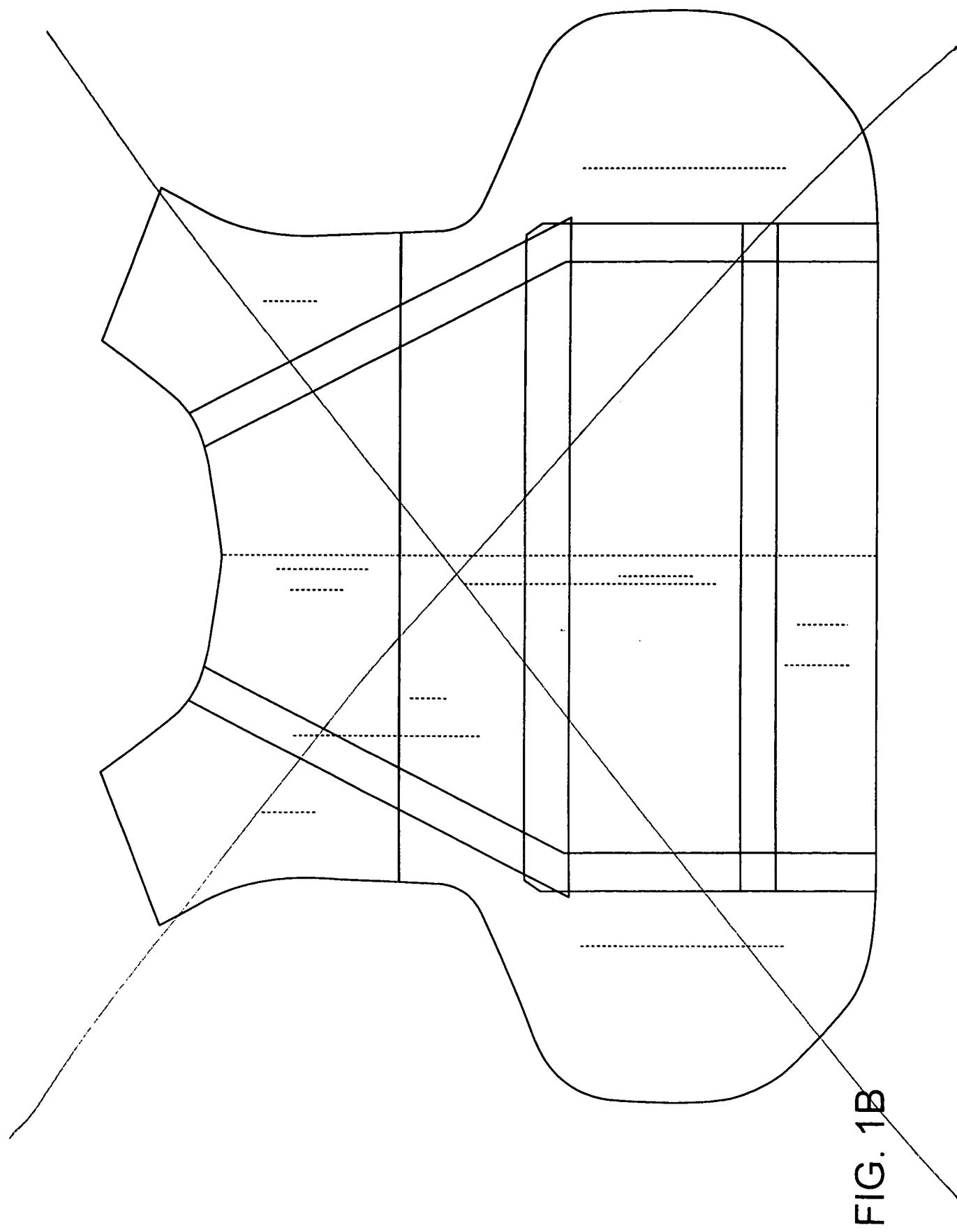


FIG. 1B

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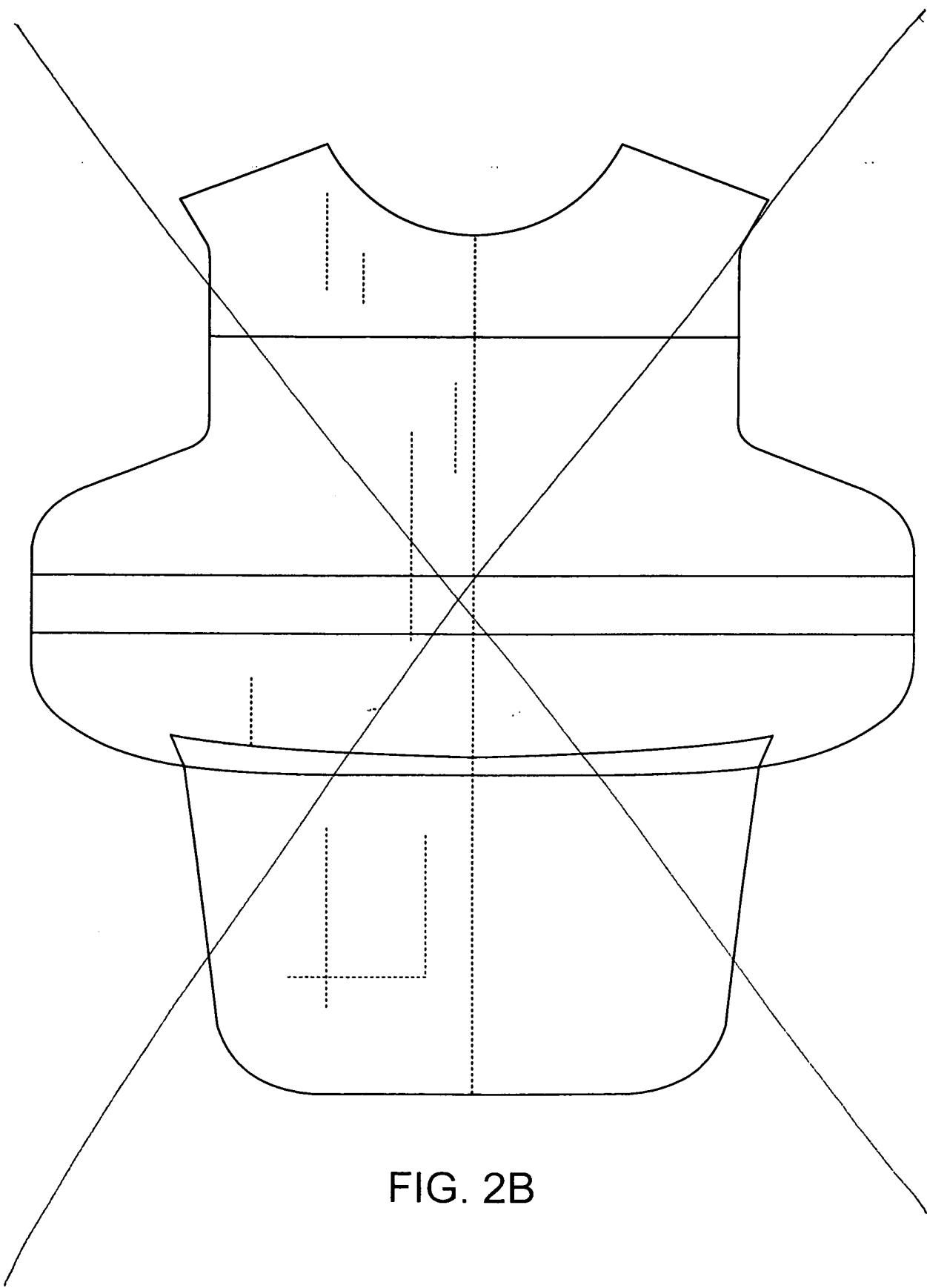


FIG. 2B

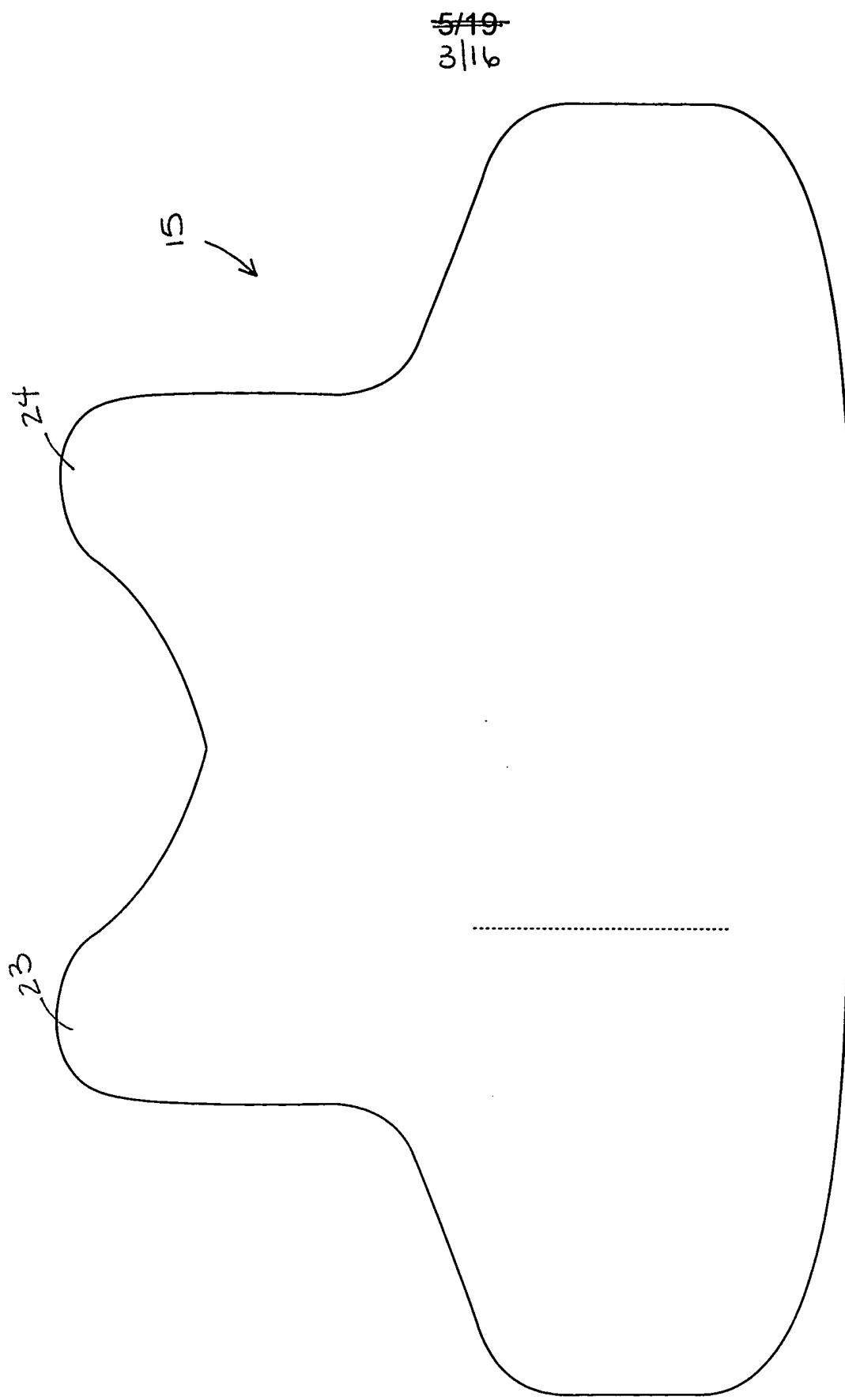


FIG. 3A

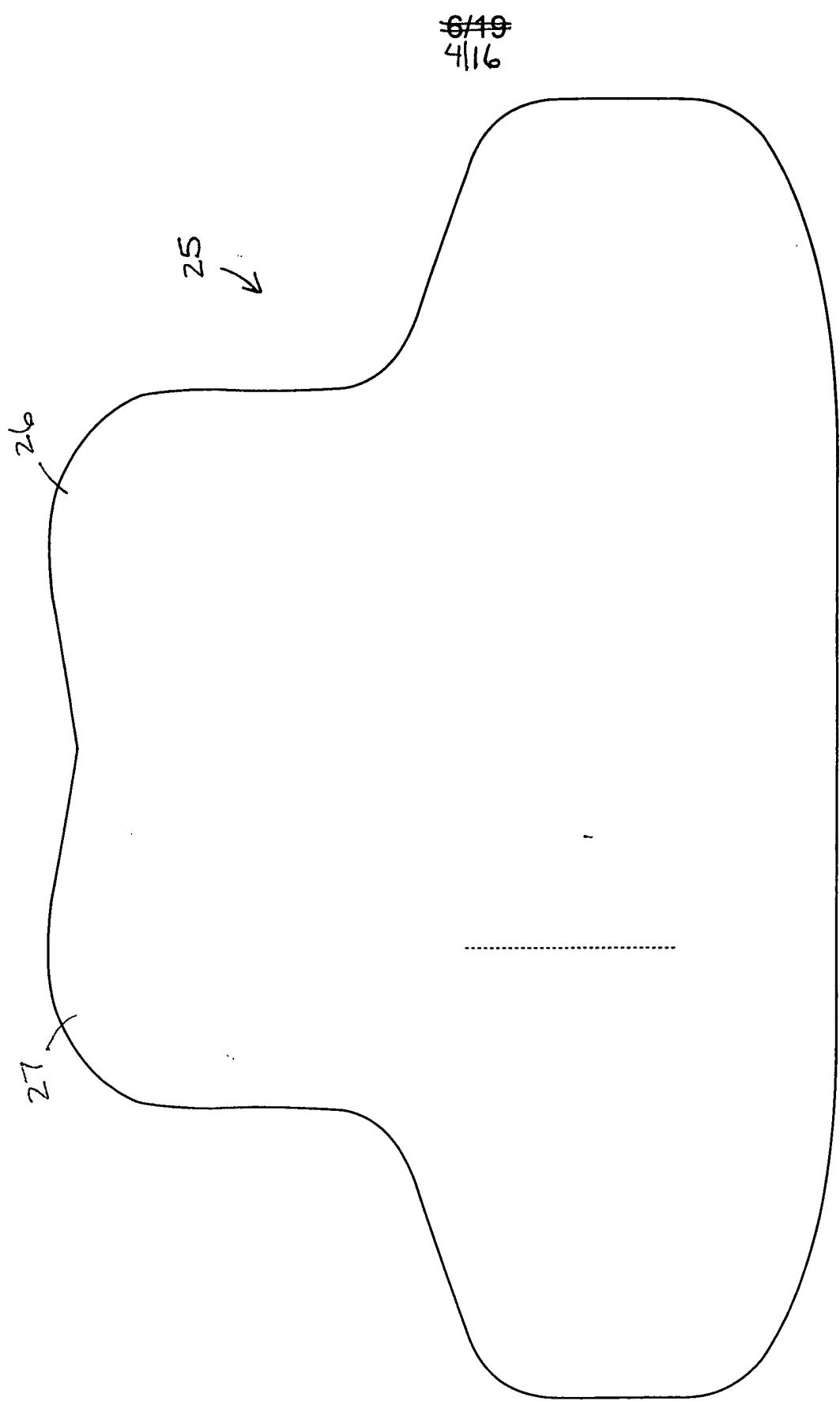


FIG. 3B

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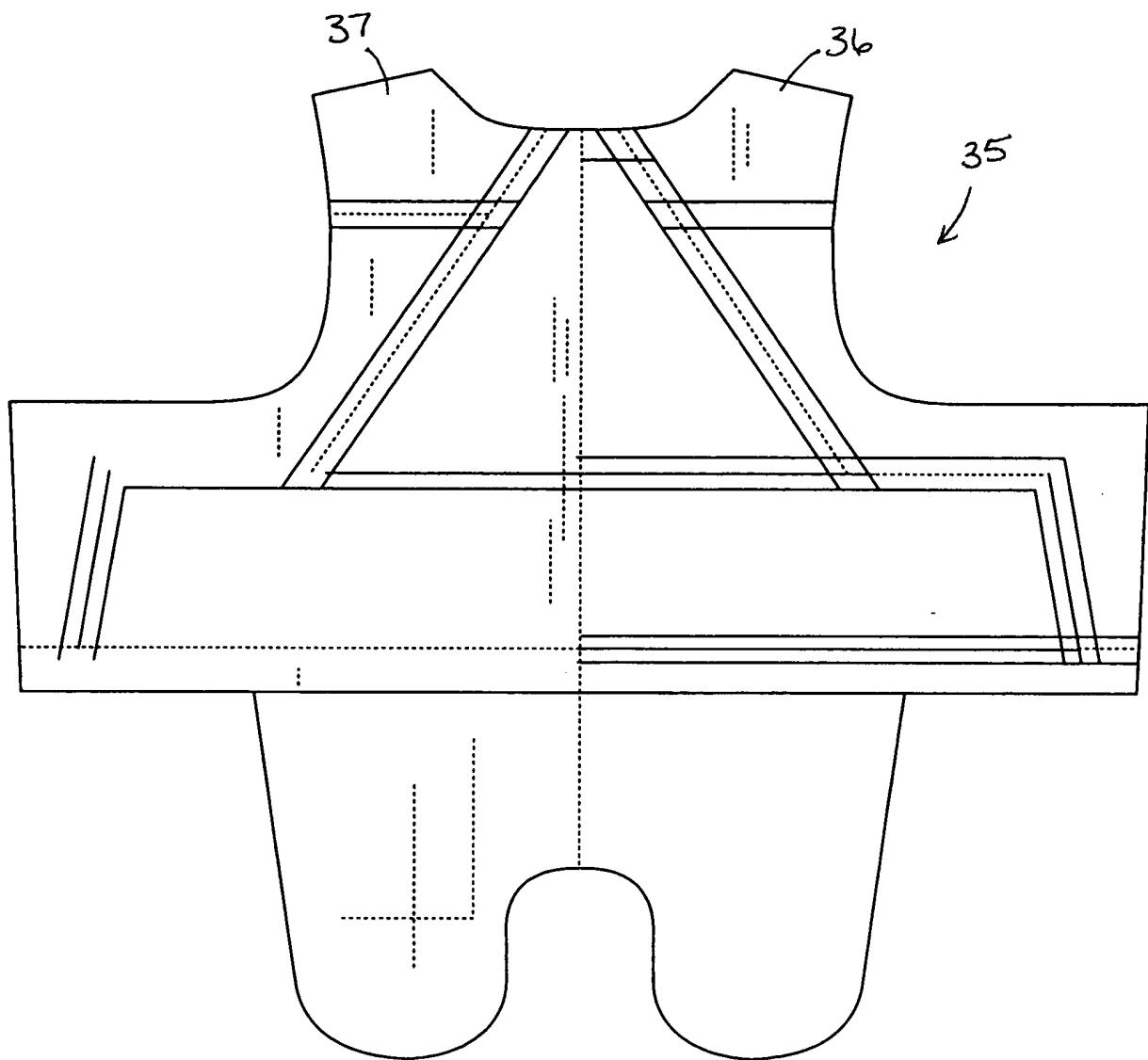


FIG. 4A

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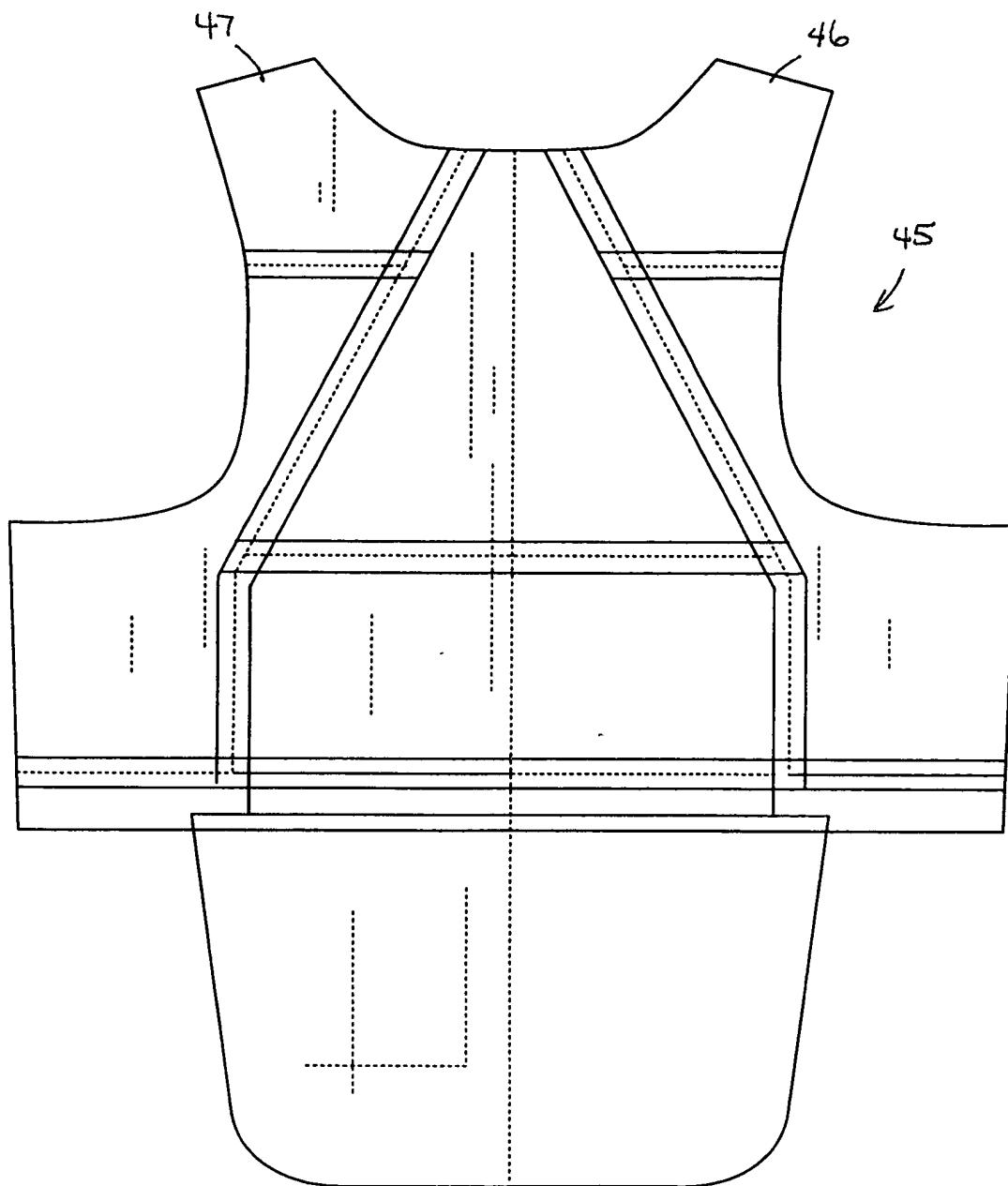


FIG. 4B

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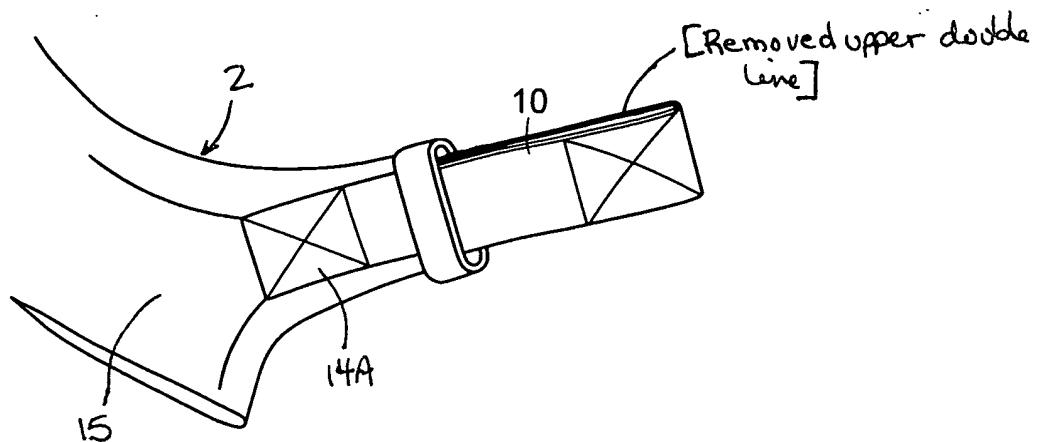


FIG. 5

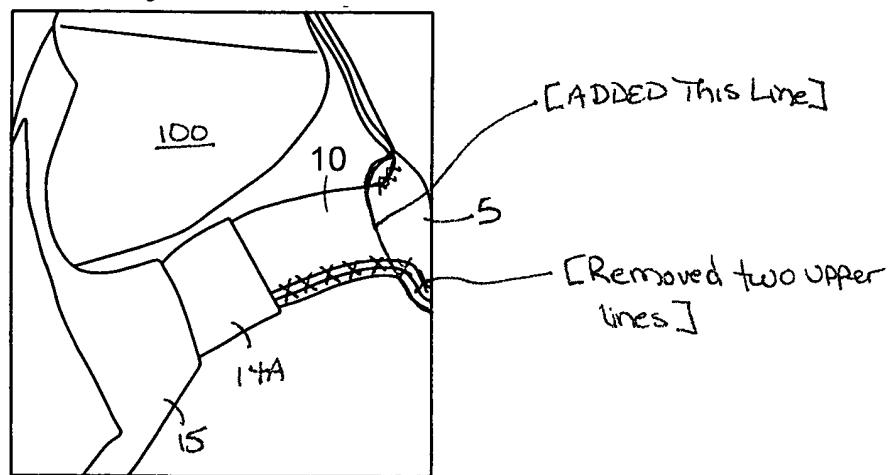


FIG. 5A

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8/16

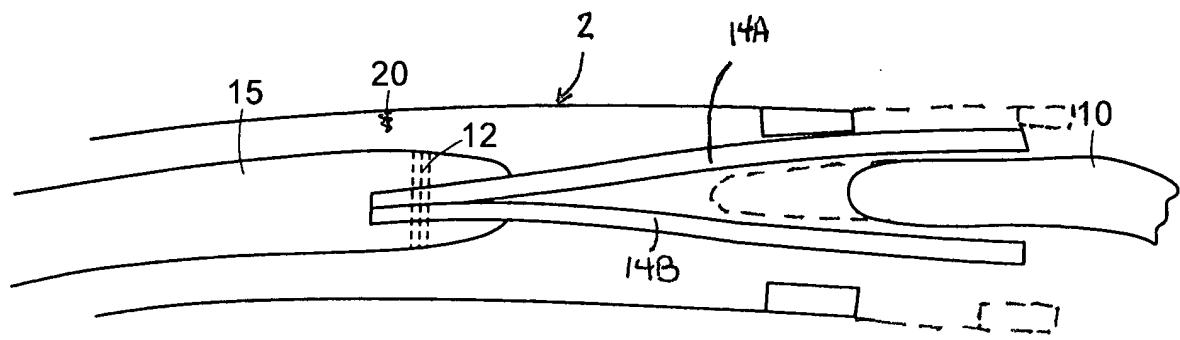


FIG. 6

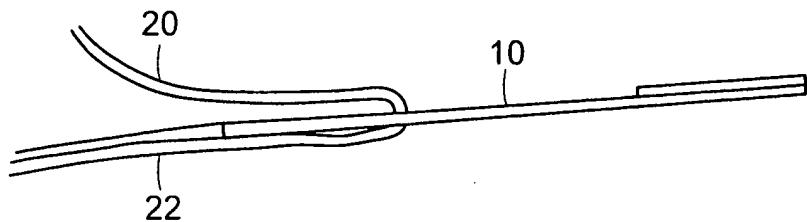


FIG. 7

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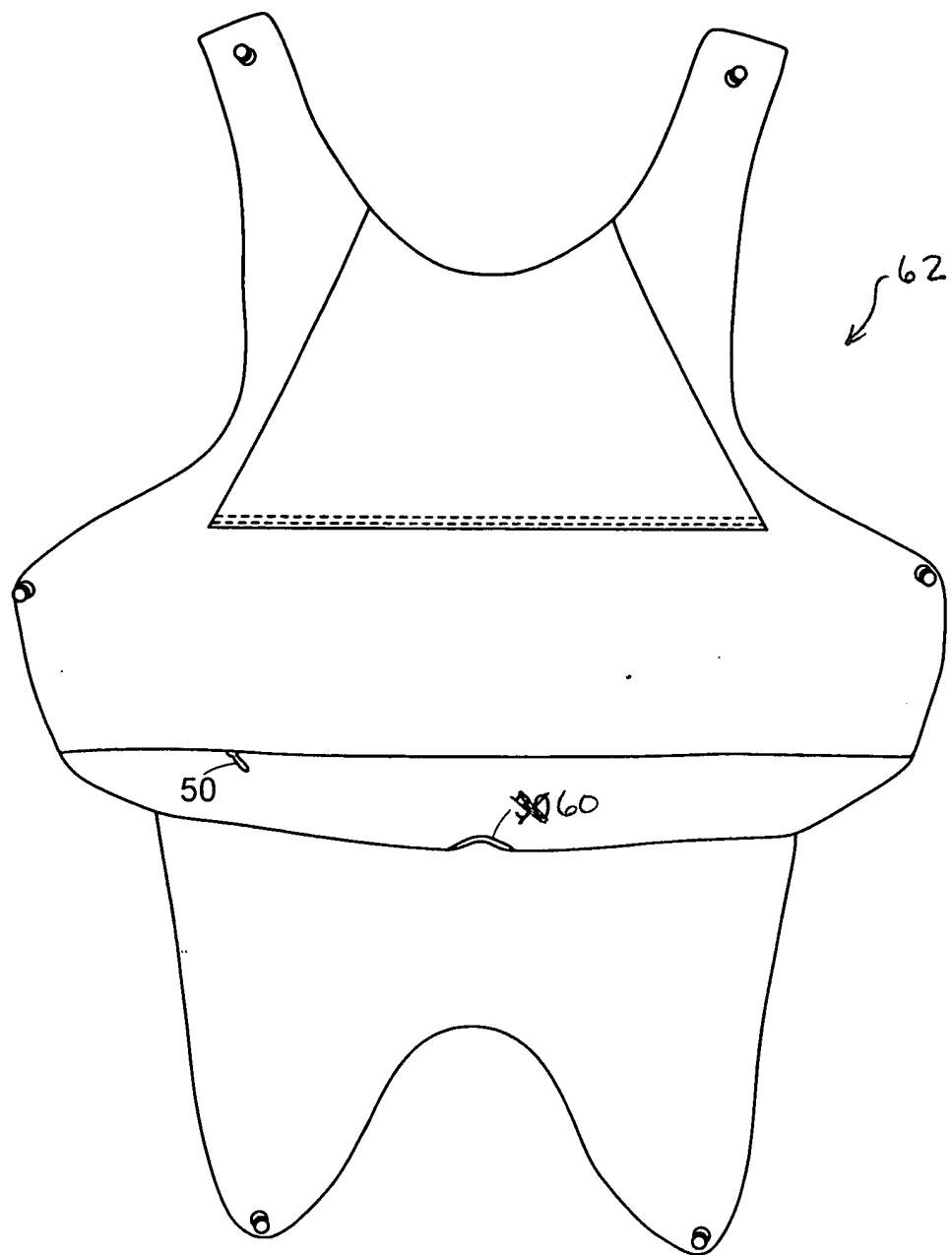


FIG. 8

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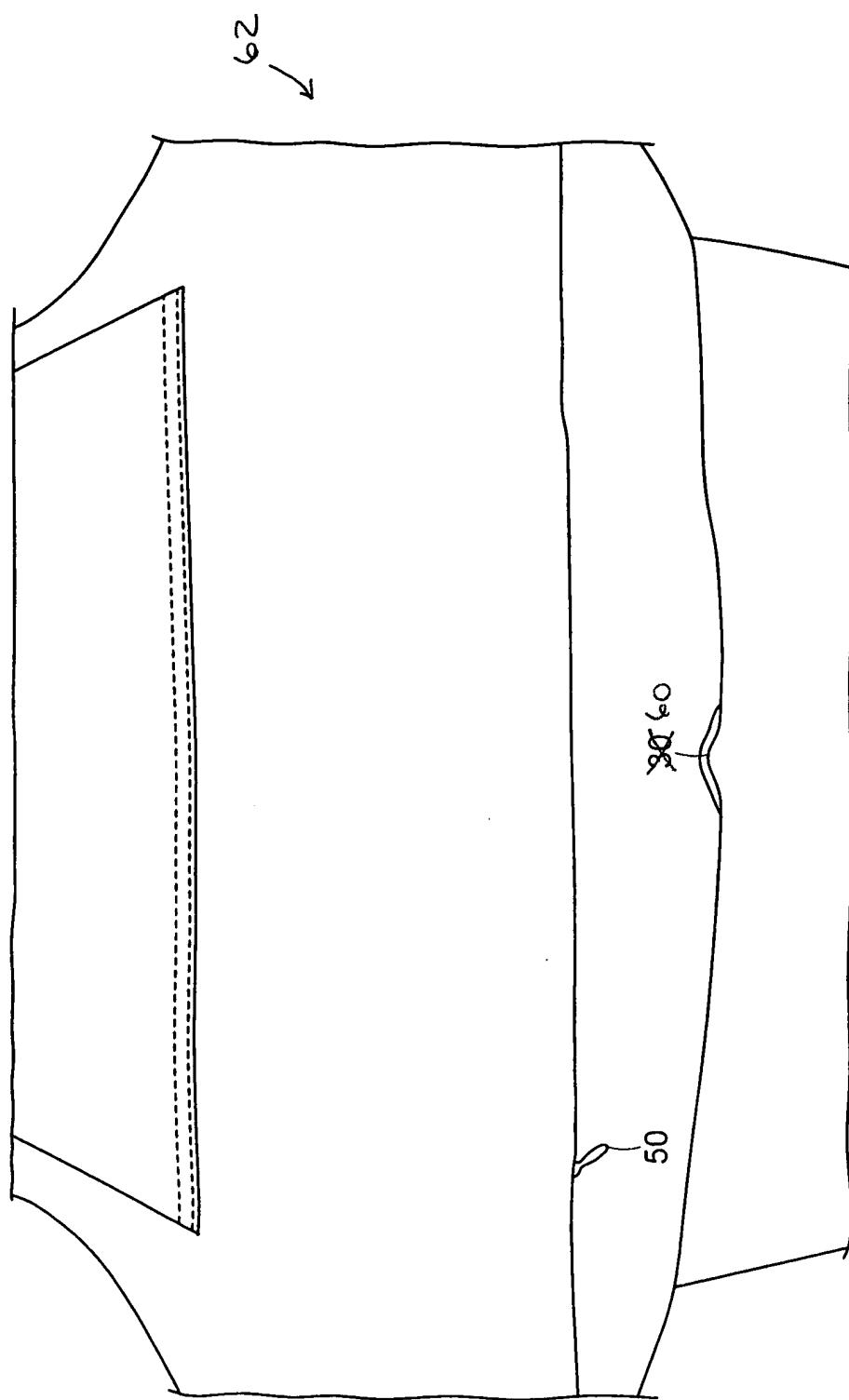


FIG. 8A

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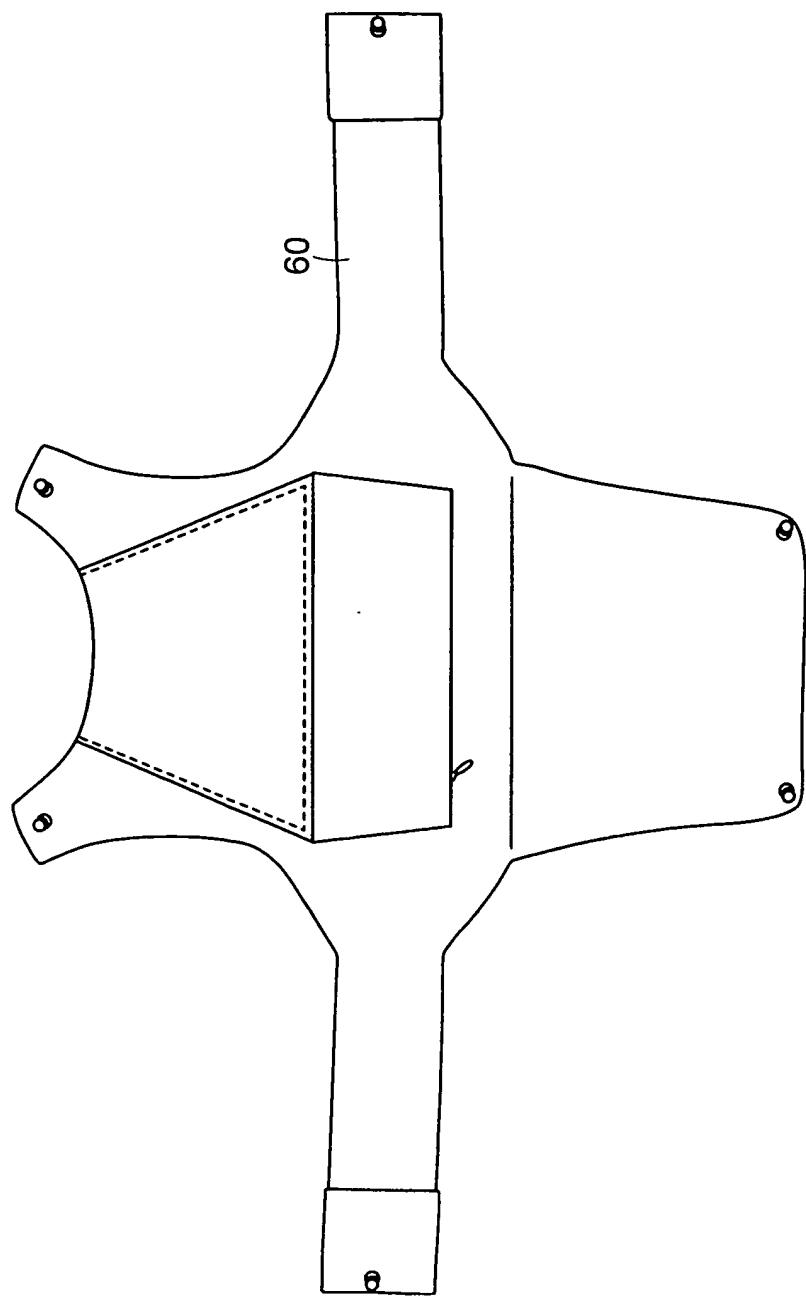


FIG. 9

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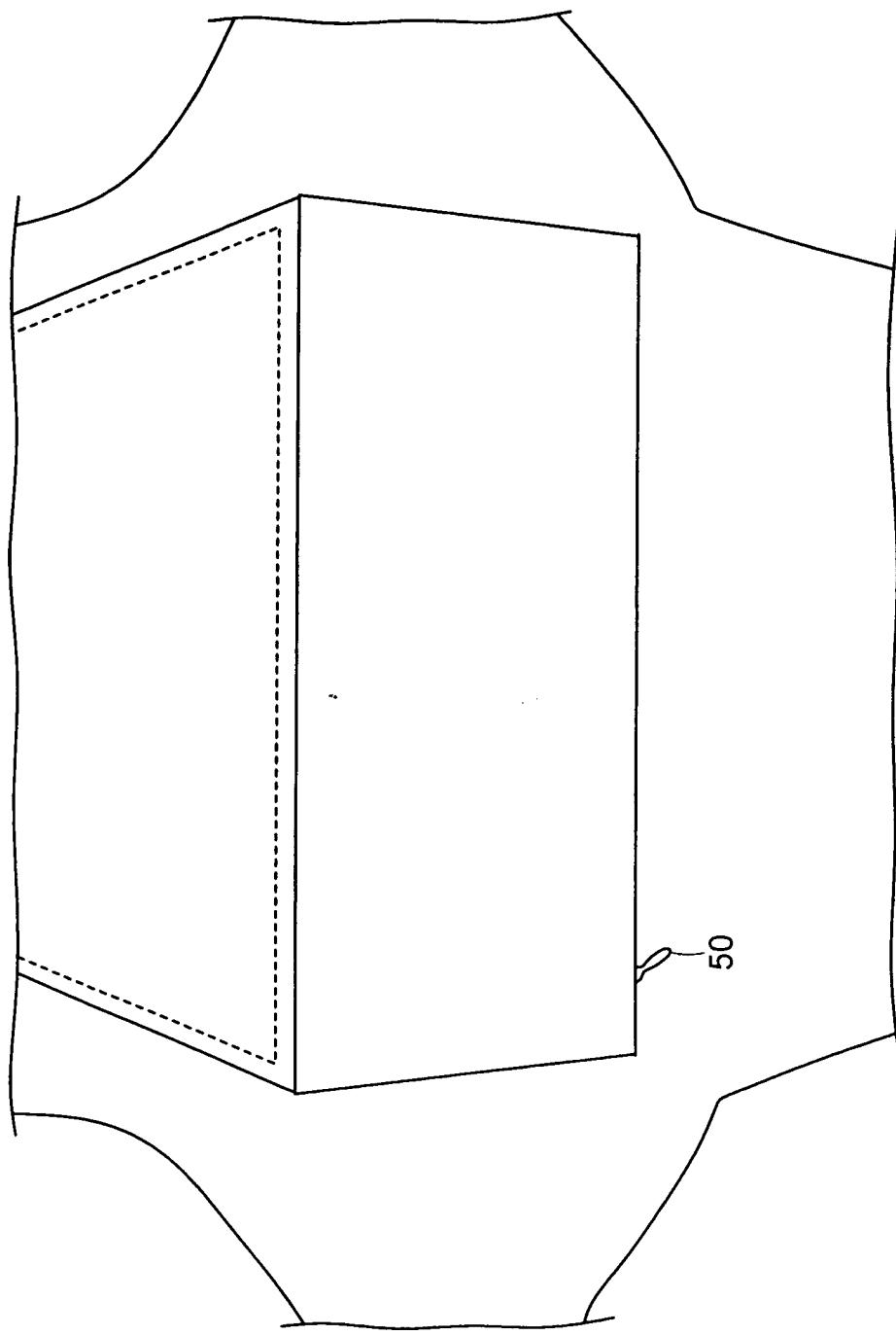


FIG. 9A

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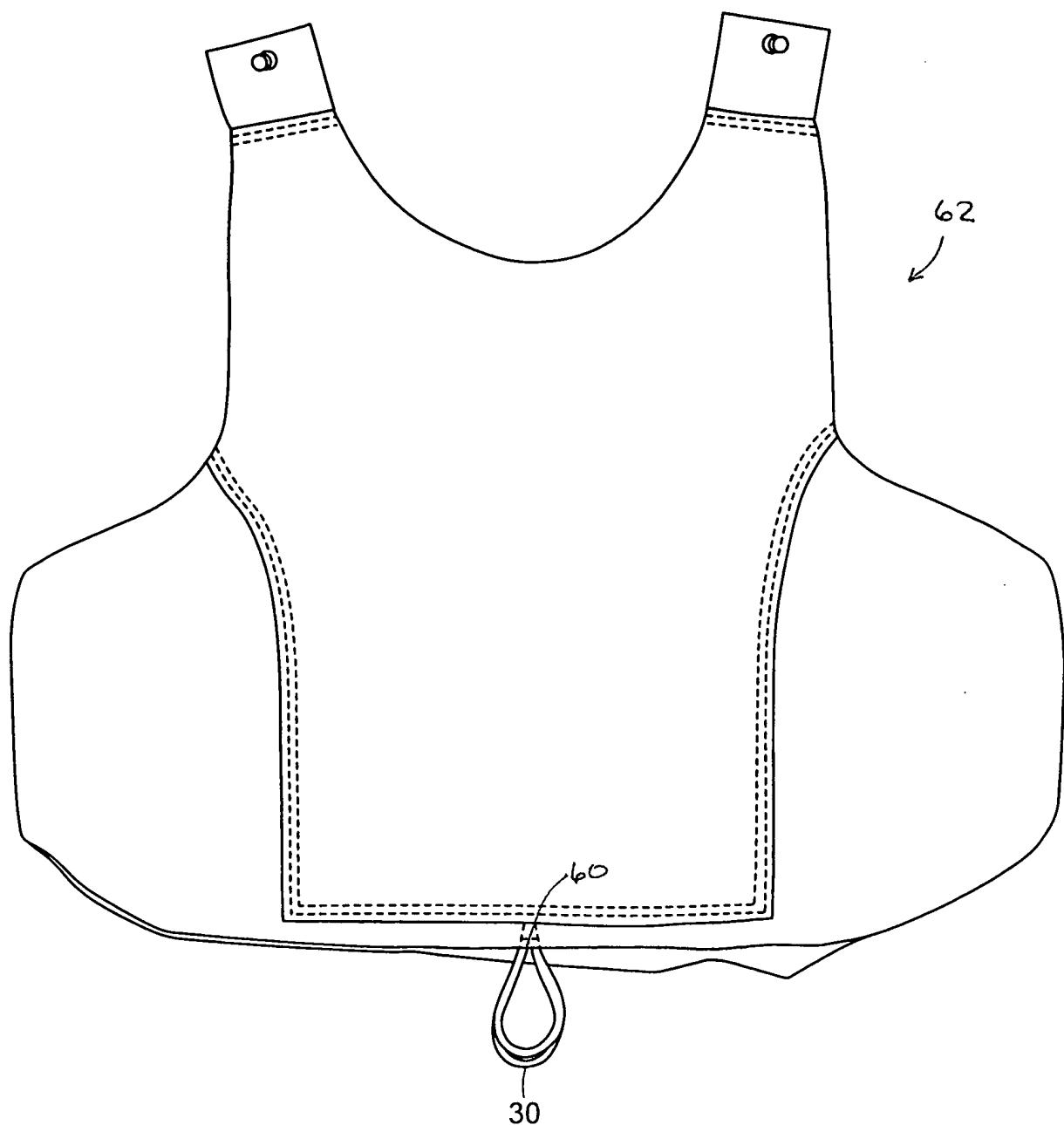


FIG. 10

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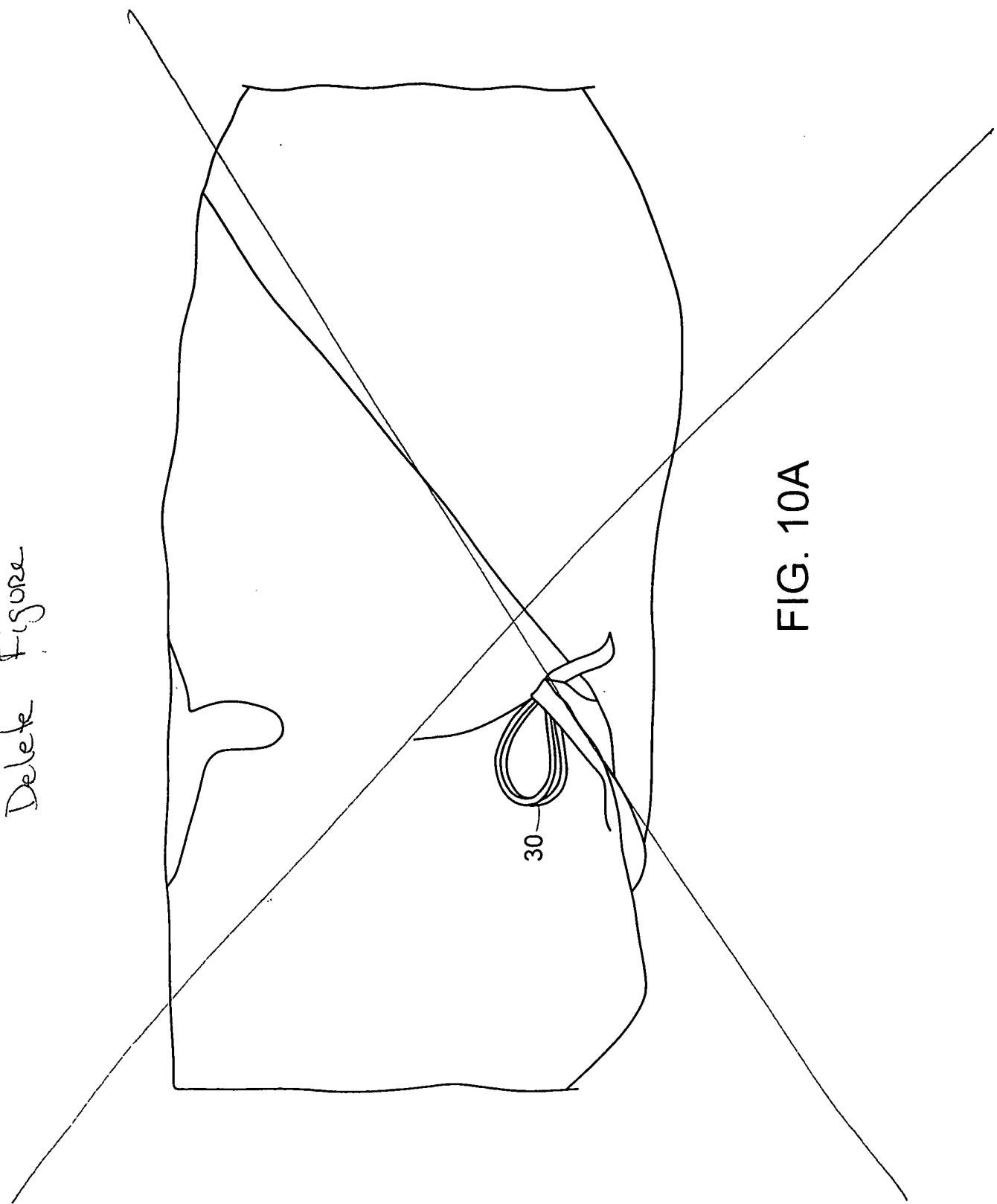


FIG. 10A

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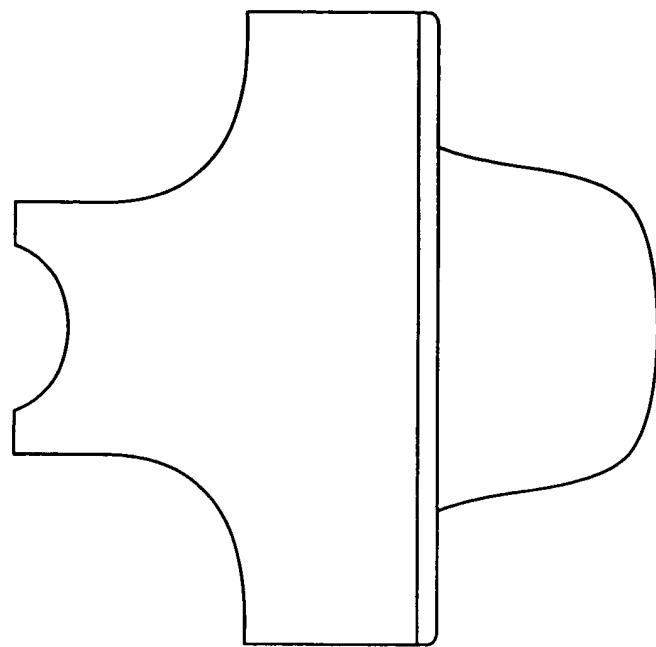


FIG. 11B

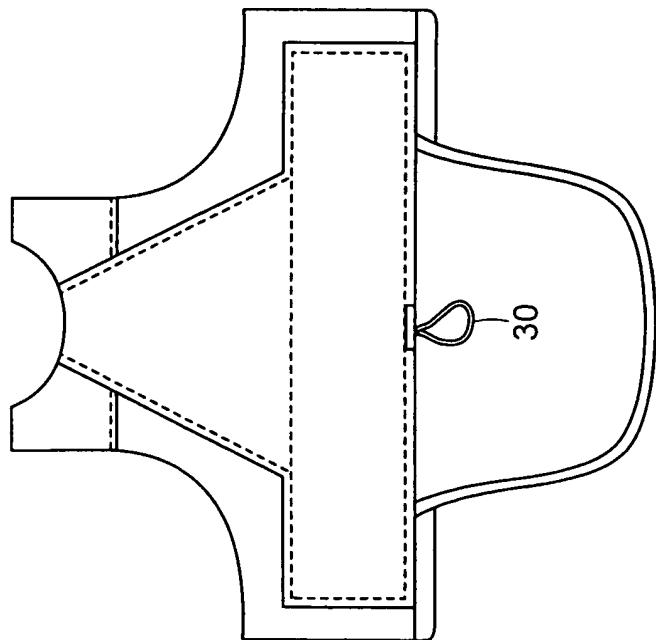


FIG. 11A

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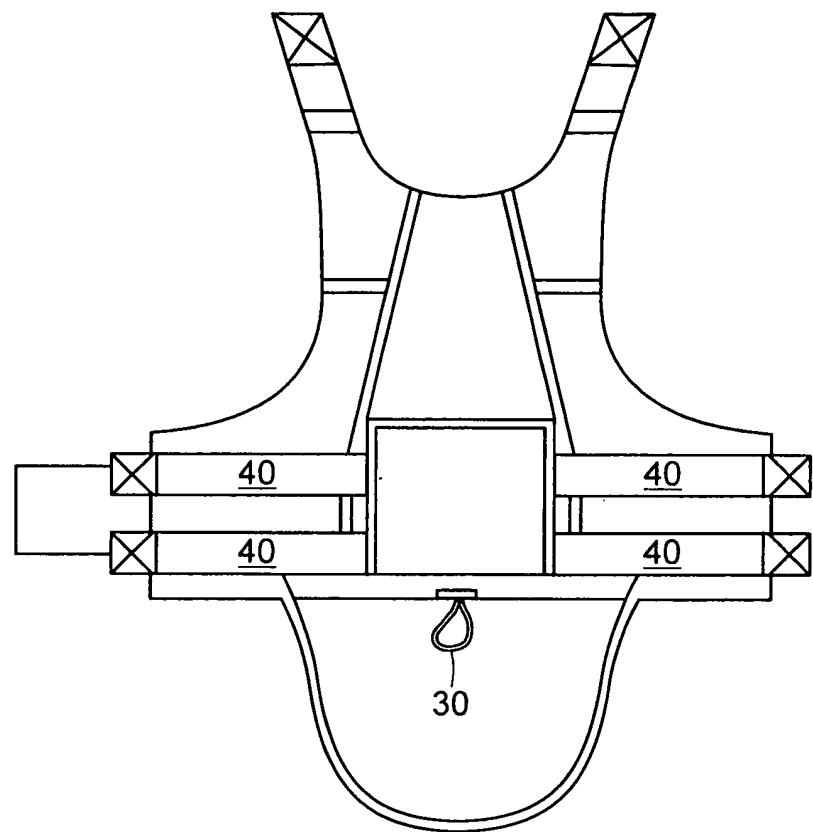


FIG. 11C

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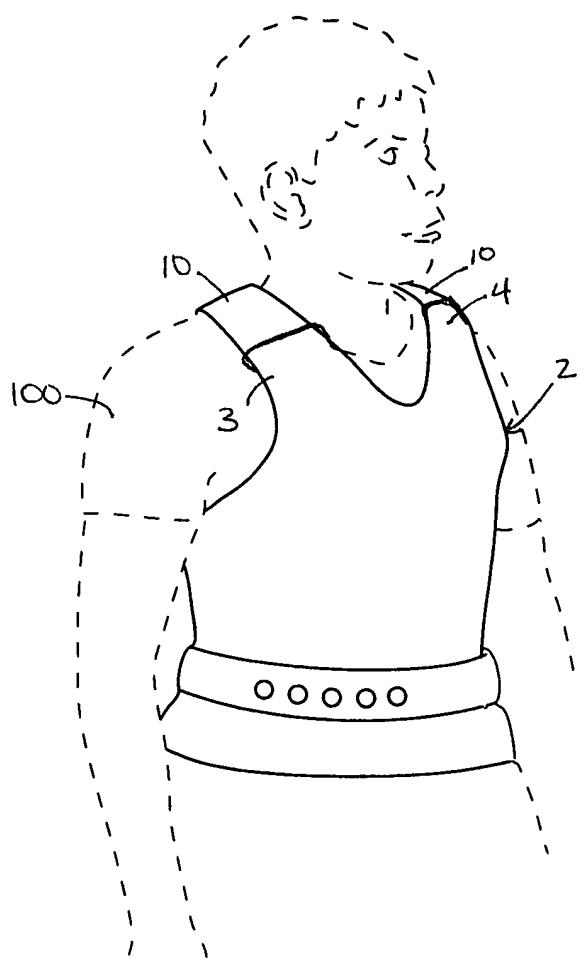


FIG. 12A

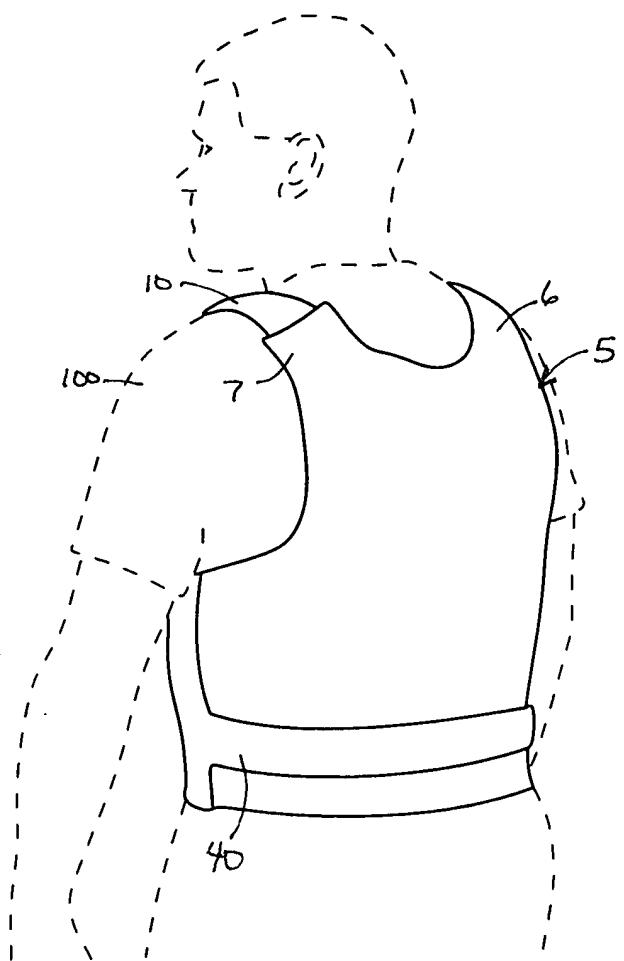


FIG. 12B

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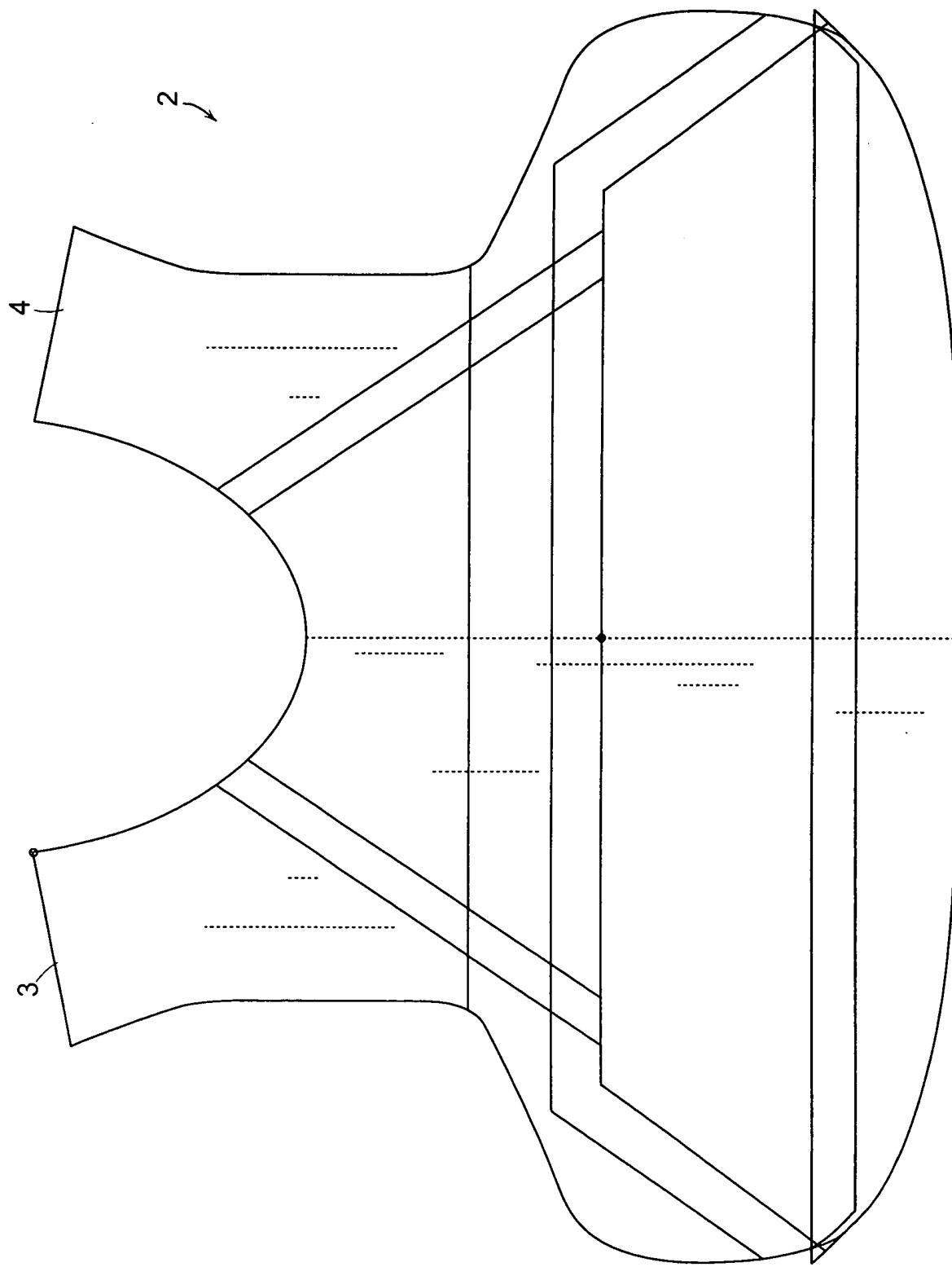


FIG. 1

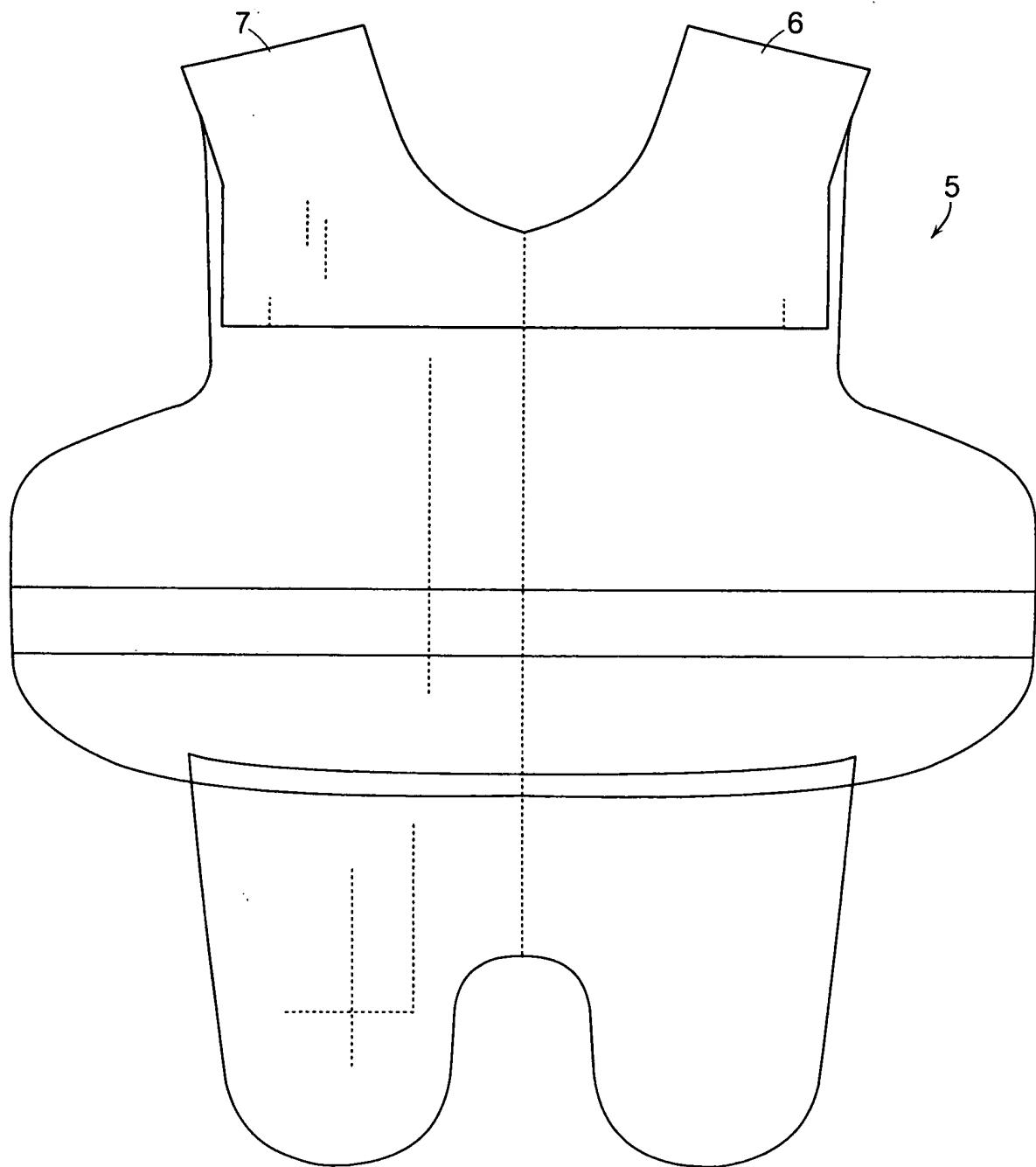


FIG. 2

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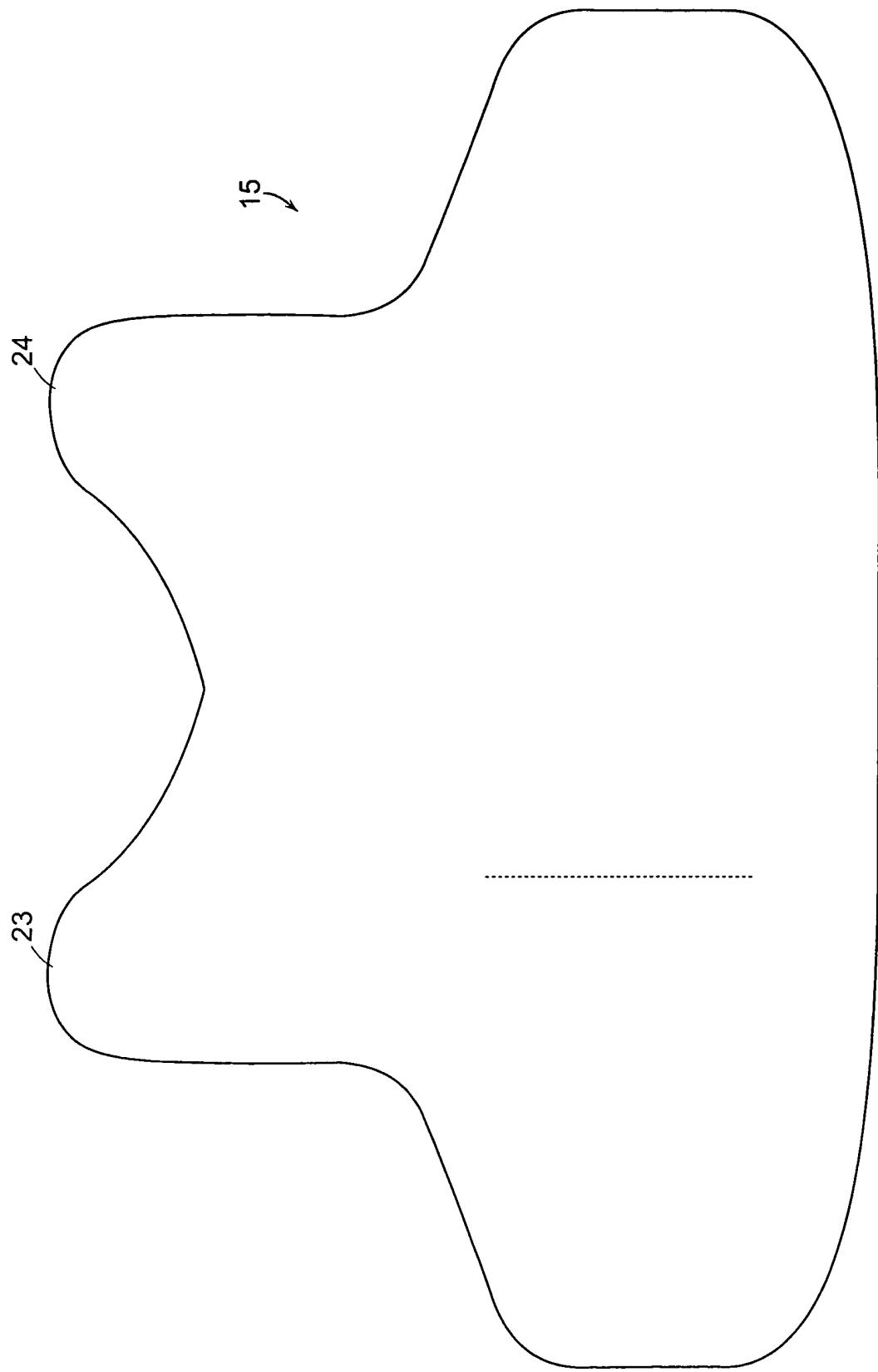


FIG. 3A

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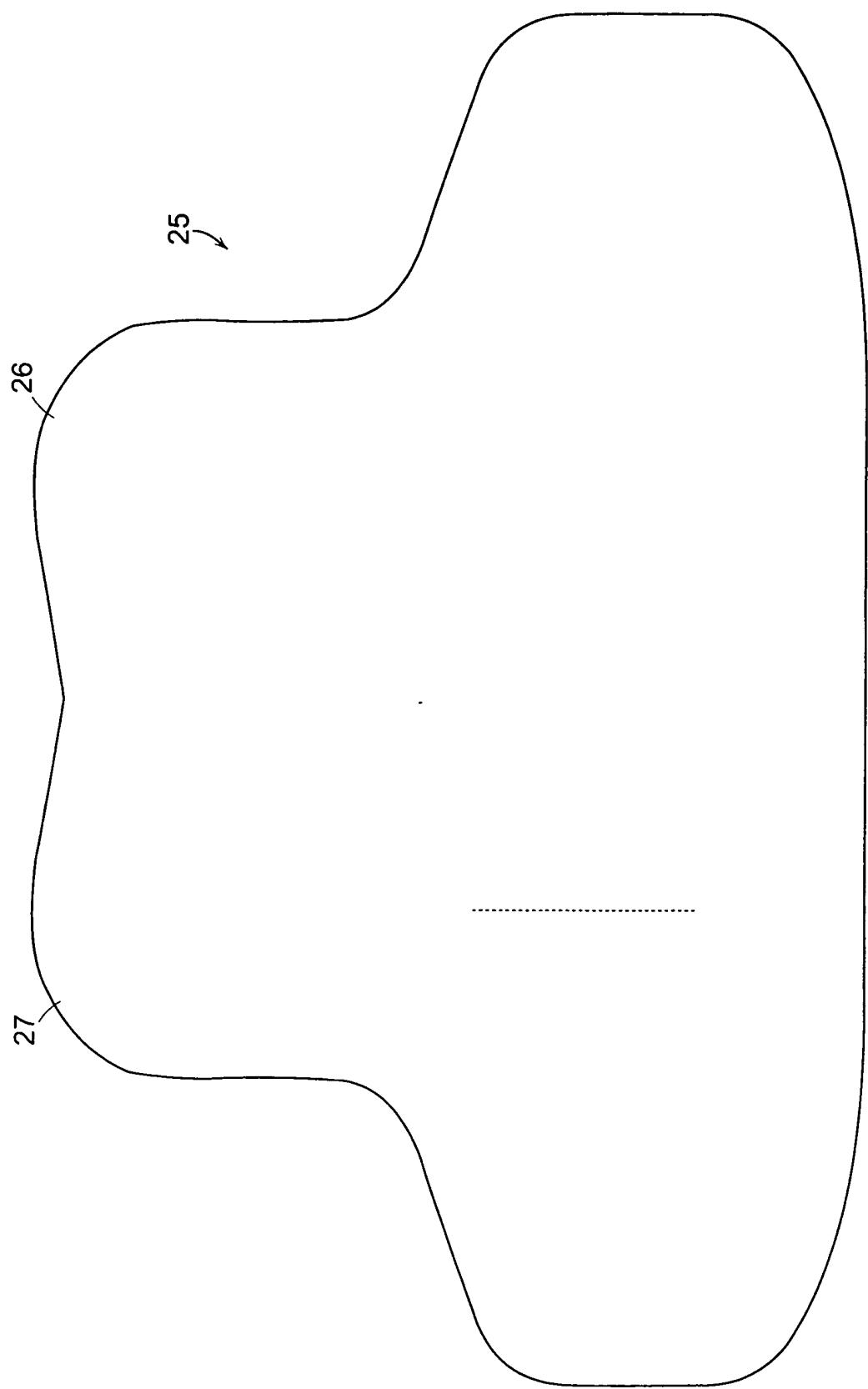


FIG. 3B

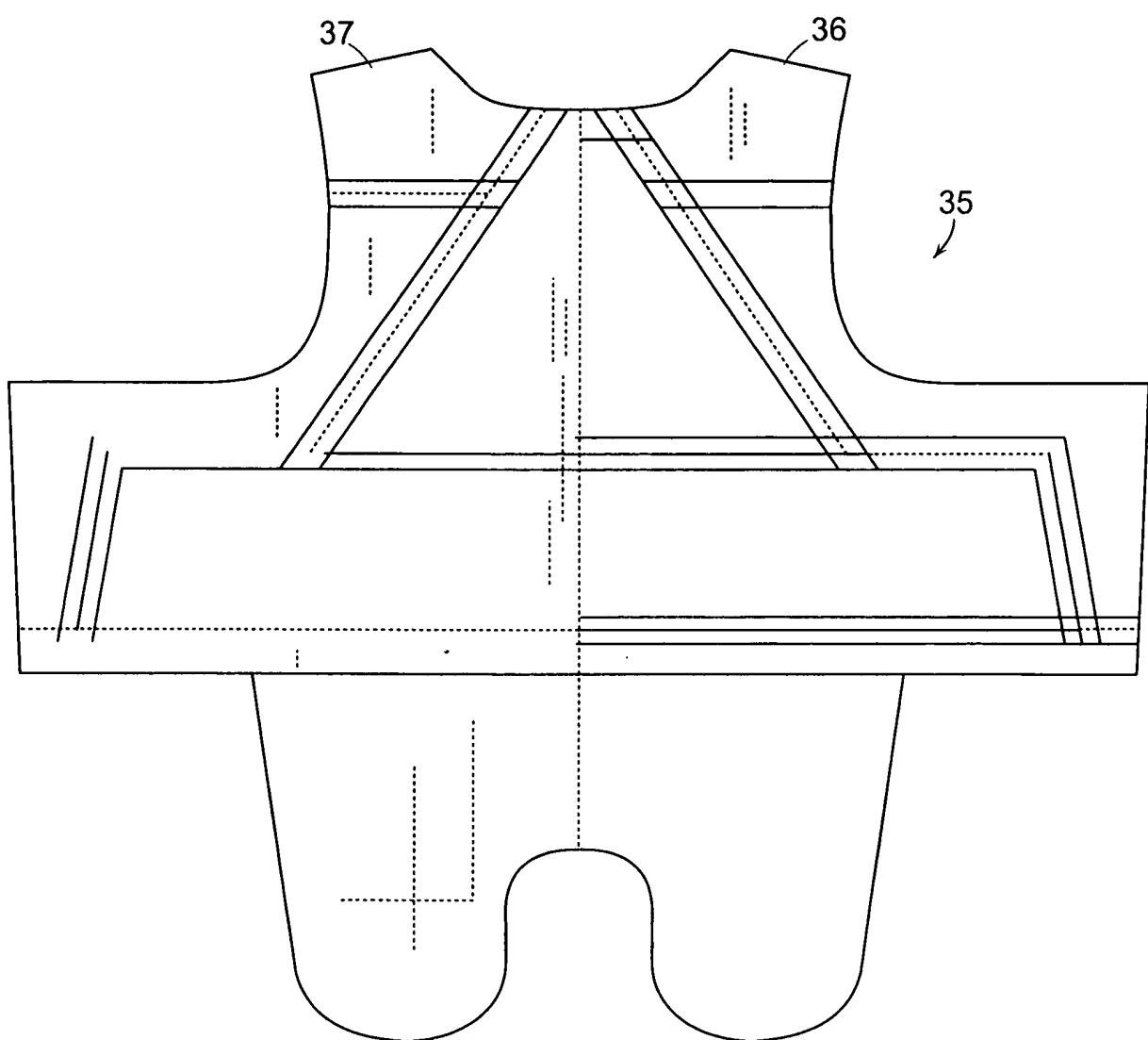


FIG. 4A

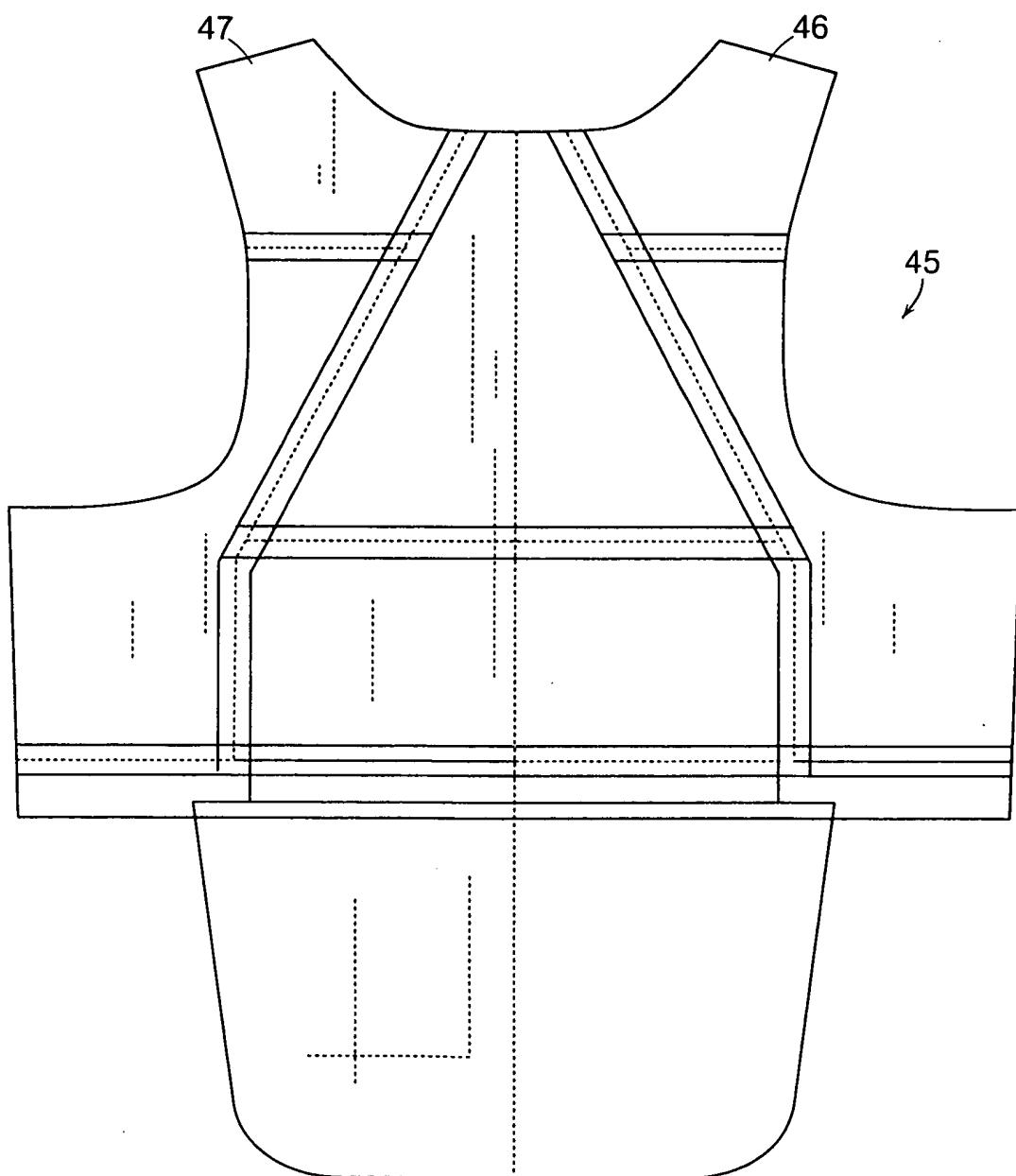


FIG. 4B

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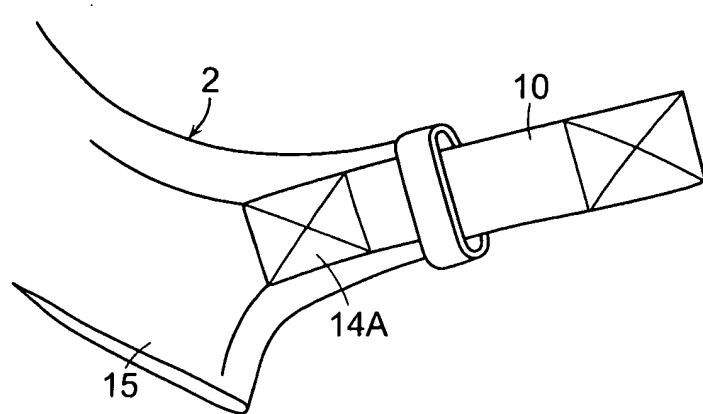


FIG. 5

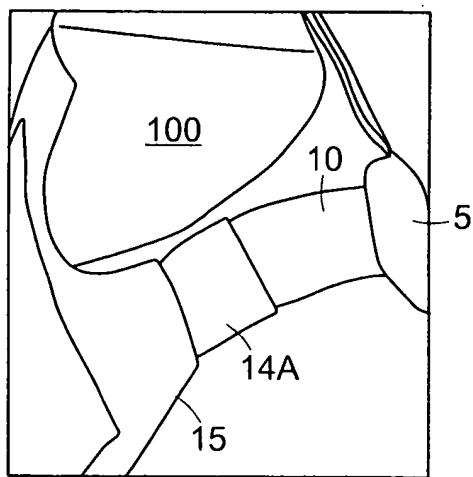


FIG. 5A

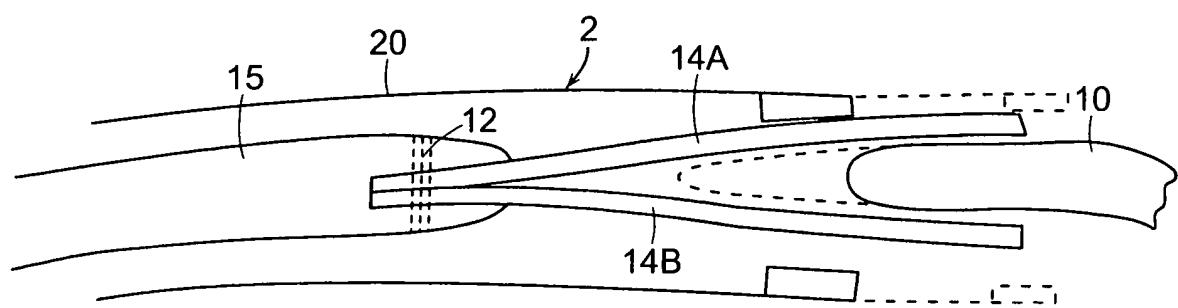


FIG. 6

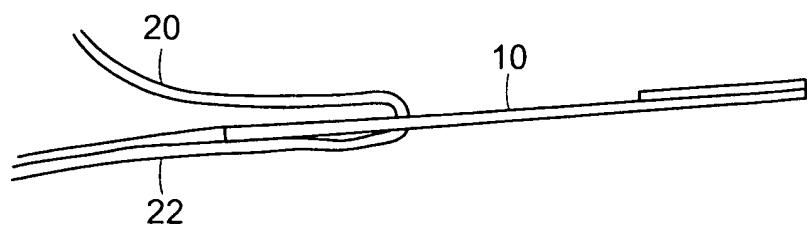


FIG. 7

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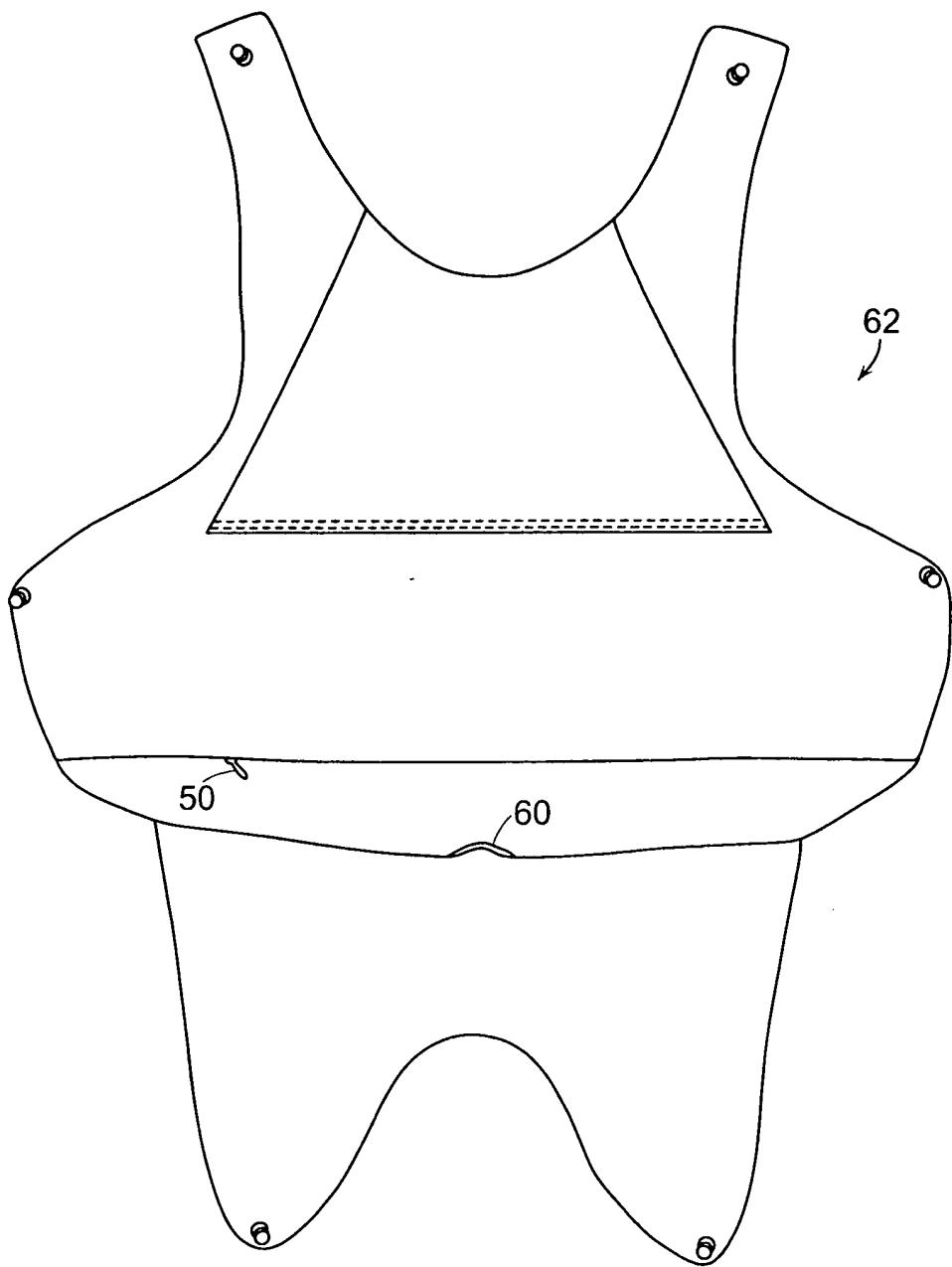


FIG. 8

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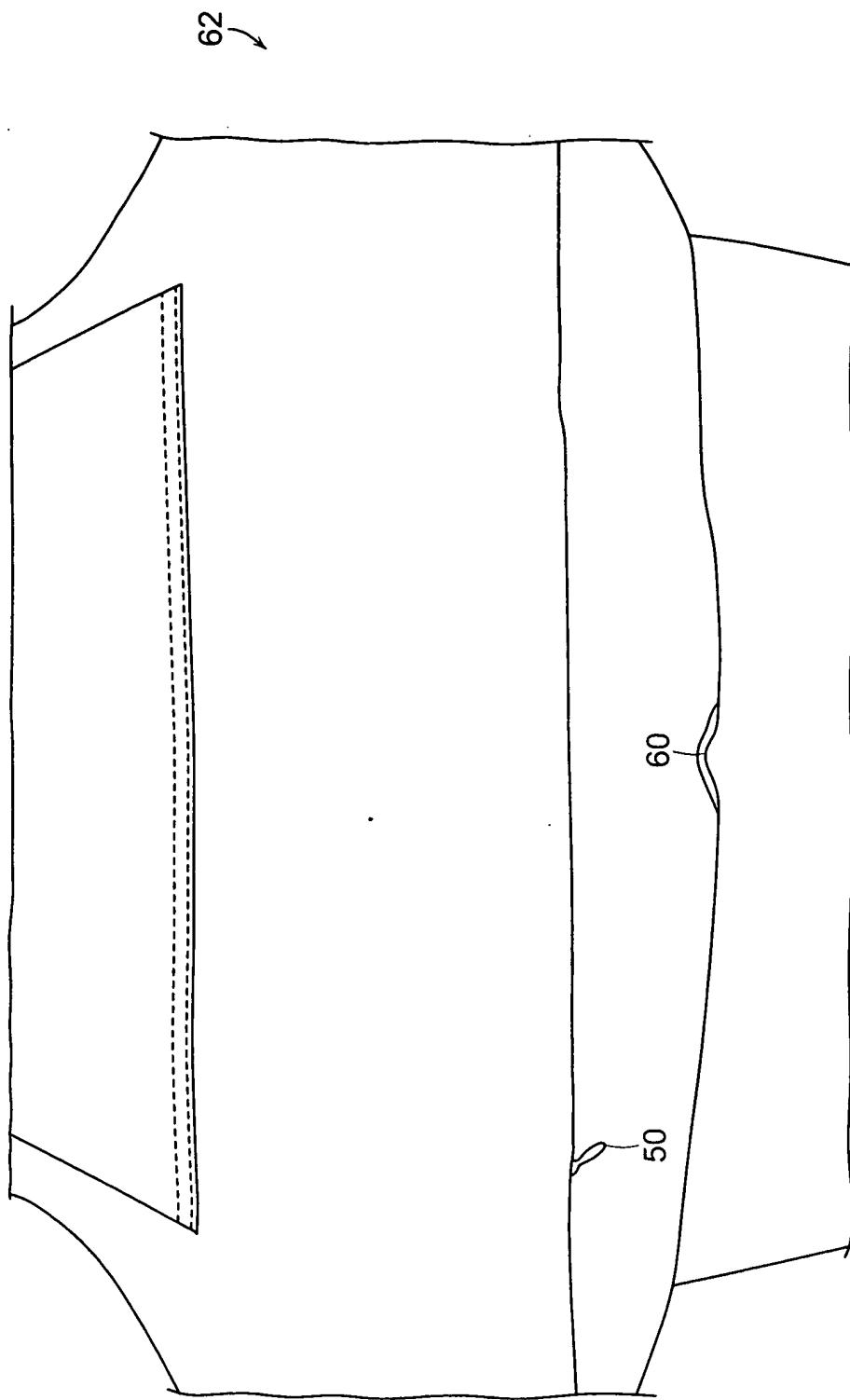


FIG. 8A

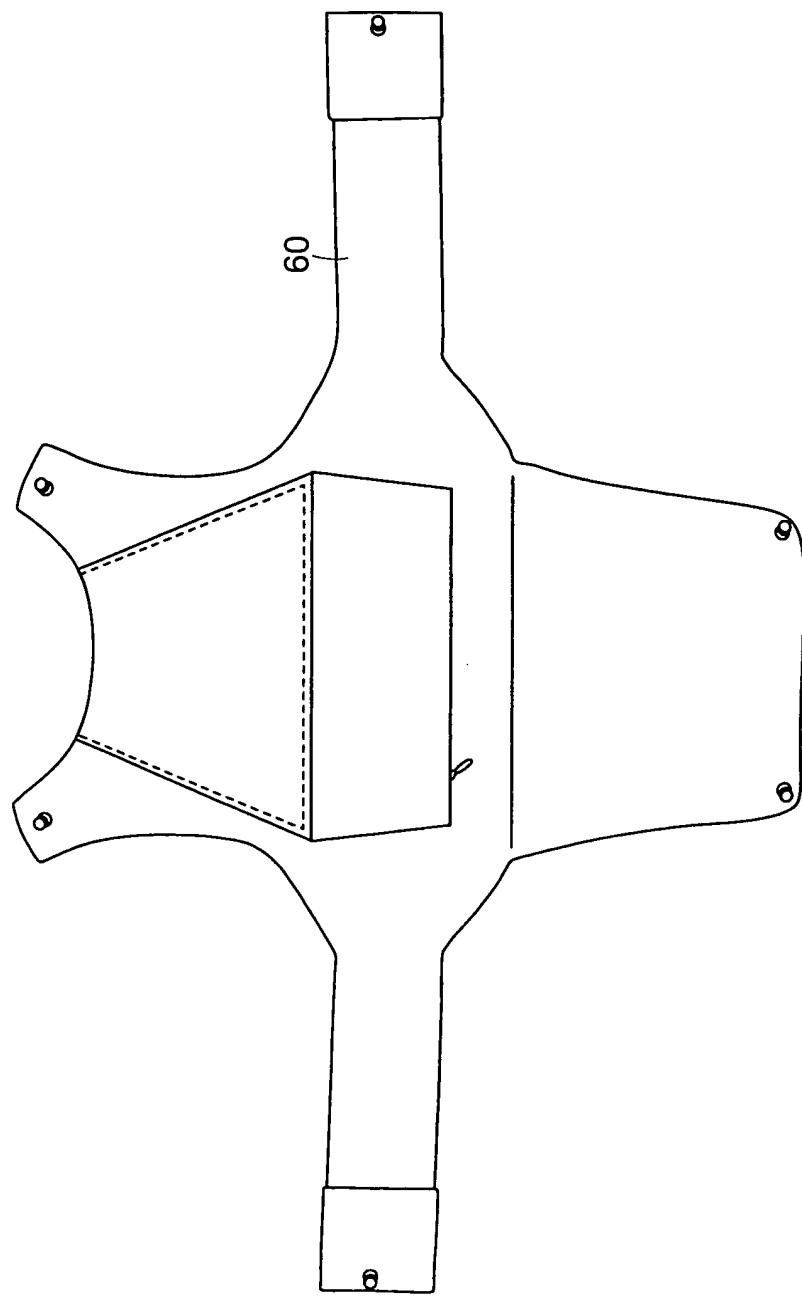


FIG. 9

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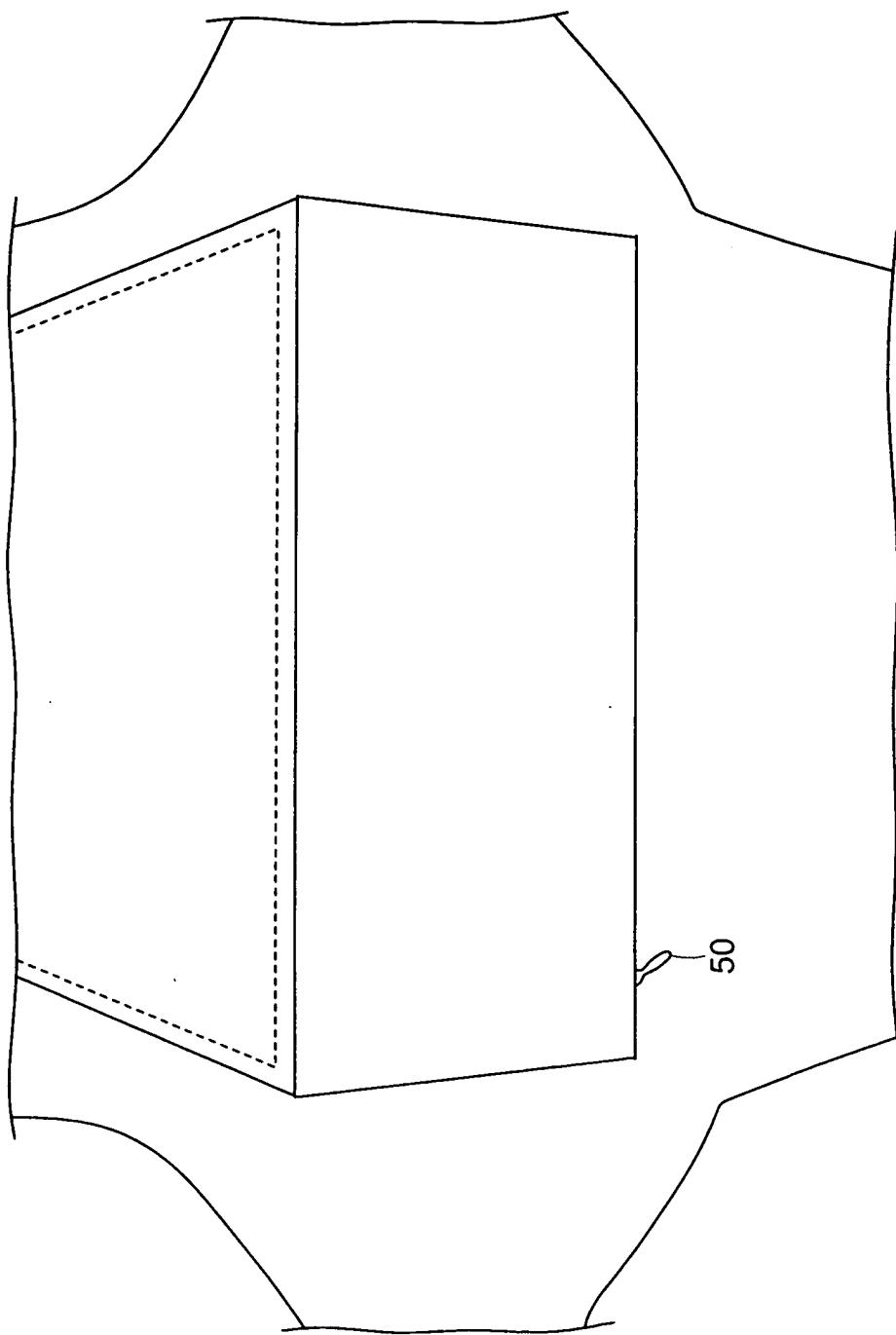


FIG. 9A

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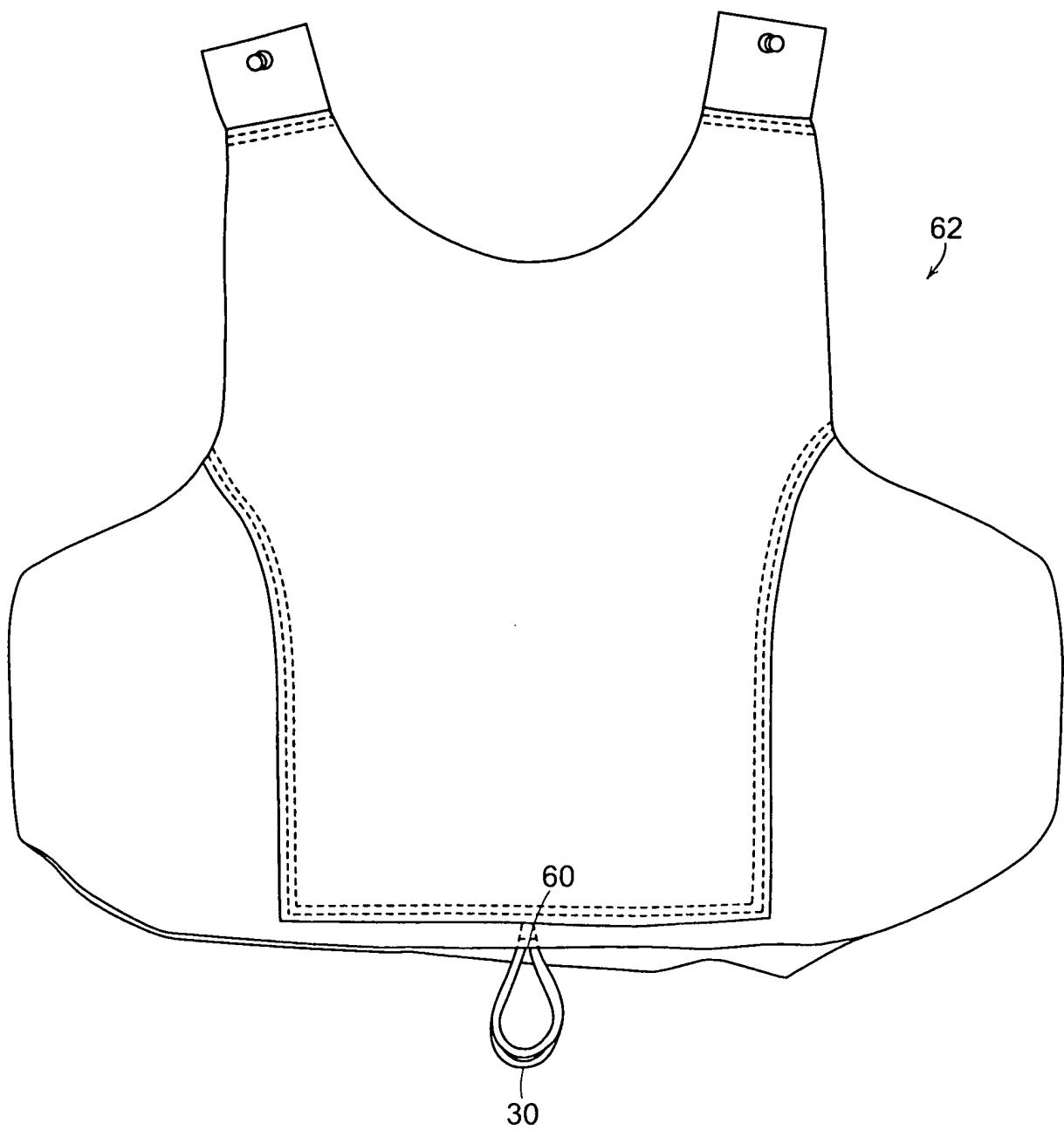


FIG. 10

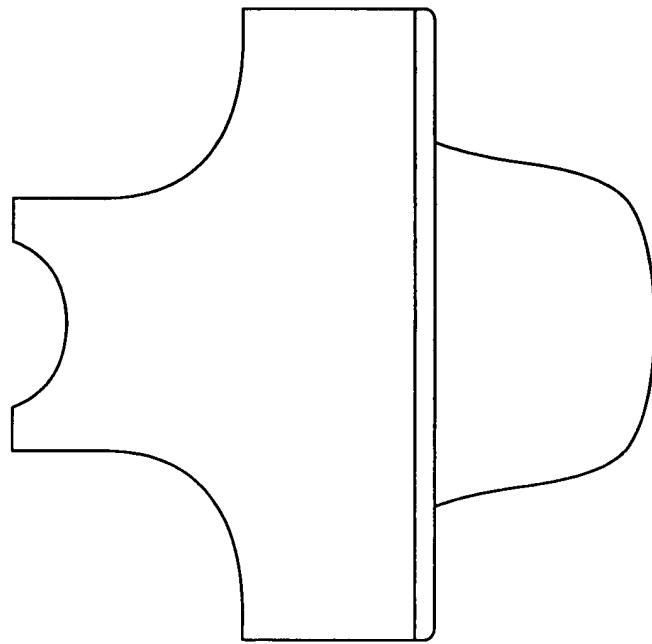


FIG. 11B

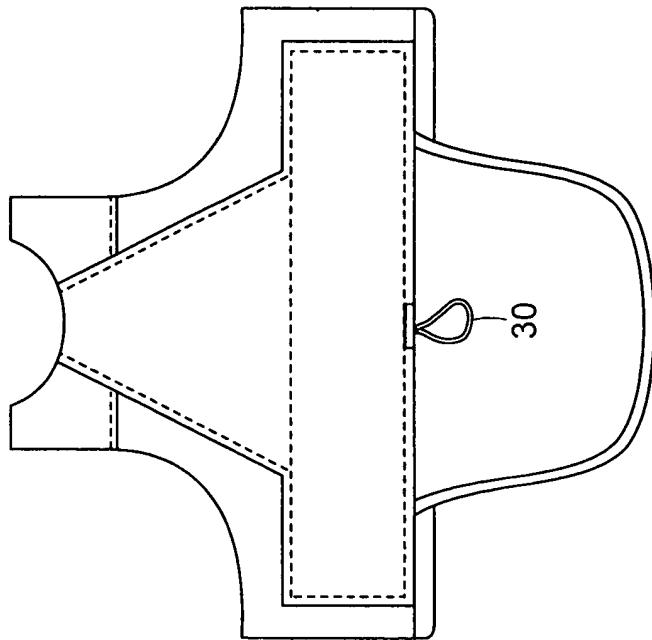


FIG. 11A

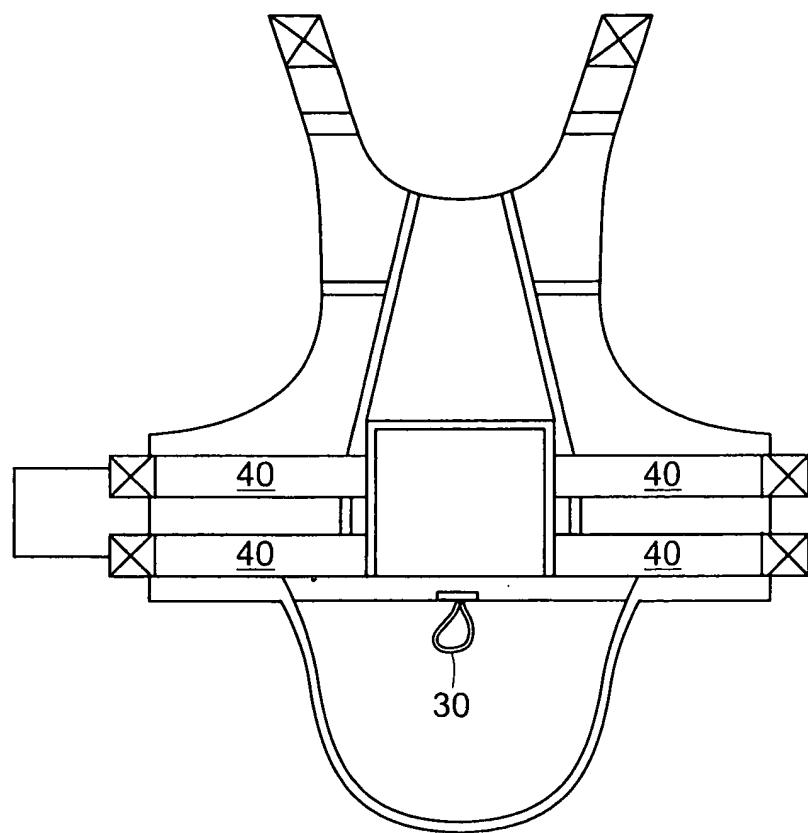


FIG. 11C

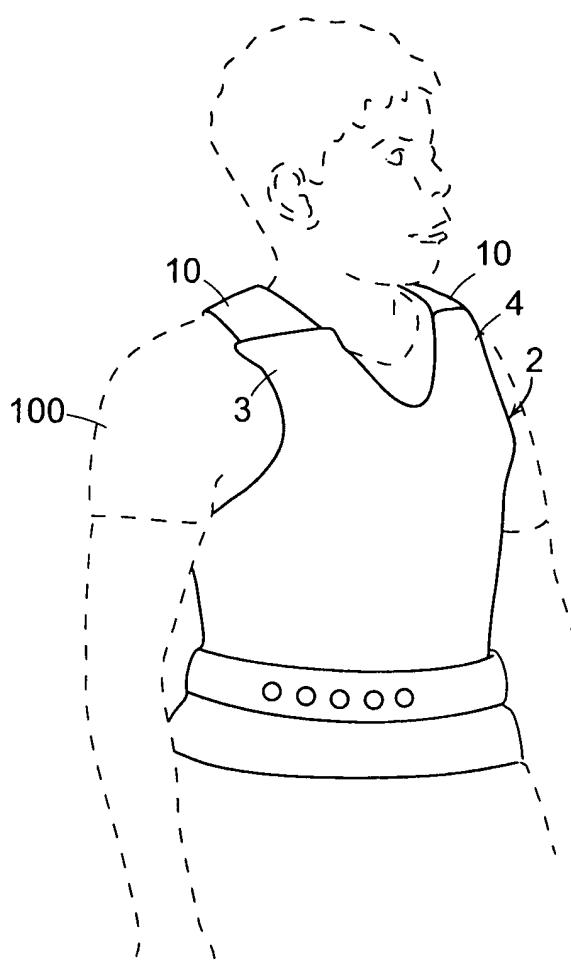


FIG. 12A

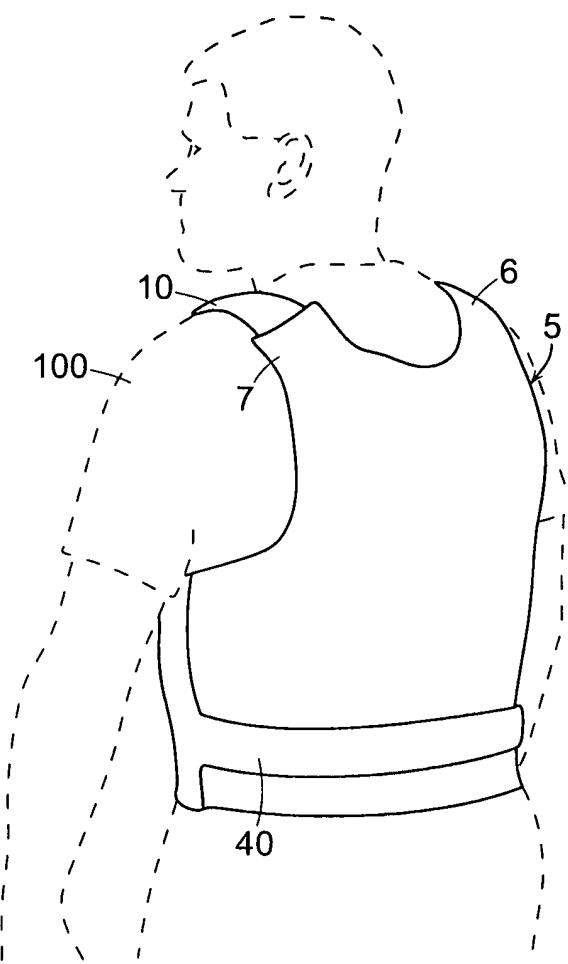


FIG. 12B